CLASS 528, SYNTHETIC RESINS OR NATURAL RUBBERS -- PART OF THE CLASS 520 SERIES

SECTION I - CLASS DEFINITION

Class 528 provides for all processes of preparing polymers from reactants wherein at least one reactant is devoid of ethylenic unsaturation. In addition, Class 528 provides for processes of removing contaminates or undesirable materials from a polymer, for processes of physically treating polymer-material, or for processes of chemically modifying a polymer without the addition of any extraneous material.

SECTION II - LINES WITH OTHER CLASSES AND WITHIN THIS CLASS

Listed below are rules to be followed in (1) placing patents into Class 528 and in (2) determining the appropriate subclasses to be searched in Class 528.

A. Classification in Class 528, subclasses 1-425 is on the basis of the reactants utilized. Some general rules to be followed in determining such reactants are as follows:

Process claim recites preparing an intermediate which is then reacted in a further step in preparing an additional intermediate

A + BC (Intermediate)

C (Intermediate) + D solid final product.

In this case, the reactants are A, B, and D. If reactant D is first appearing in the schedule array, there is no necessary cross-referencing to A, B, or to the intermediate C; however, if A or B is first appearing then a cross-reference should be placed in the subclass providing for C.

B. Process claim starts with intermediate C (i.e., no positive preparation step claimed for intermediate C). Reaction calls for C (Intermediate) + D solid final product. In this case, reactants are C and D and classification is on the basis of the first reactant appearing in the schedule array. See (M) for classification of an intermediate condensation product.

C. Patentee claims polymer C. Examiner or searcher must look to the disclosure to see reactants utilized.

D. A liquid polymer which is exposed to an after treatment step is classified as a reactant.

E. When the claims and disclosures are silent as to whether the polymer treated is a liquid or solid, the polymeric material is to be regarded as a liquid and therefore as a reactant.

F. When the claims are silent as to whether the polymer prepared is a solid or liquid and the disclosure is alternative, disclosing both solid and liquid materials, original classification is on the basis of general rules of schedule hierarchy and the alternative species is mandatorily cross-referenced.

G. When the claims are drawn to alternative claimed subject matter involving solid and liquid polymers, original classification is appropriate on the basis of general rules of schedule hierarchy and the alternative species is mandatorily cross-referenced.

H. Where there are generic claims presented (i.e., alternative)as well as species claims such species claims will generally control for classification purposes over the generic presented claims.

I. Markush claims of A or B are regarded as individual species and classification is appropriate on the basis of general rules of schedule hierarchy.

J. Claims which are drawn to an intermediate condensation product as a reactant wherein applicant alleges indefinite structure for the condensation product, are classified on the basis of the reactants utilized in preparing the intermediate condensation product.

Urea-formaldehyde, phenol-formaldehyde, and methylol melamine are considered as being indefinite materials and are classified as urea + formaldehyde, phenol + formaldehyde, and melamine + formaldehyde.

The reaction of a urea-formaldehyde condensation material + melamine product to yield product is C is classified on the basis of either urea, formaldehyde, or melamine, depending upon which is the first-appearing reactant provided in the schedule array.

If, however, the intermediate condensation product is of such definiteness as to be definable by applicant as a chemical compound, e.g., ester, polyester, polyether, polyamide, etc., such intermediate will be viewed as a compound and classified accordingly. An example of the aforementioned concept is as follows: Applicant

starts with a (C) polyester prepared by reacting A + B. (C)polyester + isocyanate (D)--- polymer (E). Reactants are C and D and claim is cross-referenced to A and B if desired. If applicant identifies the final reactant product only in terms of the reactants necessary to produce such reactant product (e.g., urea-formaldehyde, etc.) classification is to be made on the basis of the reactants recited.

K. In all cases where doubt exists as to whether a material that is present during a reaction is a reactant or a nonreactant (i.e., specified material) such doubt has been resolved by looking at the material as if it were a reactant.

L. Applicants' statements as to functions of materials (e.g., catalyst, reactant, solvent, etc.) are to be taken literally and to be followed. An exception to the preceding rule is in those subclasses where specified rules are enumerated. If the Examiner has any doubts as to statements of functions, such doubts can be resolved by adequate cross- referencing. A specific exception to the rule enumerated above regarding applicants' statements is the question as to whether a material is a solid resin for the particular chemical modification subclasses which are provided in the schedule. In those cases where the claims are silent, the Examiner may resolve the question by looking at the total disclosure of the patent.

M. Classification into subclasses 1-425 is primarily on the basis of reactant utilized. It is possible, however, that polymeric products which may be identical in structure may be prepared from different reactants, and that these reactant may not be claimed or disclosed in the patent being classified. In those instances where a product is claimed which the Examiner believes may be formed from reactants which are not disclosed in the patent at hand, an optional cross-reference into the non-claimed or disclosed reactant area may be highly desirable and appropriate.

The following rules apply in classifying a claim into Class 528 in those subclasses of the schedule which provide for processes (i.e., in specified material areas).

A. Patents that claim a product and process, wherein both the product and the process are specifically provided for in the schedule, are classified in the process area and cross-referenced to the product area.

B. Patents that claim both a provided for product and a process of polymerizing, and wherein the product is claimed in process terms, are classified on the basis of the process and cross-referenced to the first-appearing reactant in the schedule utilized in preparing the polymer.

C. Patents that claim a product solely in process terms are classified on the basis of the process, when said process is provided in the schedule and cross-referenced to the first-appearing reactant in the schedule utilized in preparing the polymer.

D. Patents that claim a product in process terms, and wherein the process is not provided, are classified on the basis of the first-appearing reactant in the schedule utilized in preparing the polymer.

E. Patents that claim a polymerizable composition or the preparation of a polymerizable composition are classified on the basis of the first-appearing reactant in the schedule that is part of the polymerizable composition.

F. Patents that claim a polymer only are classified on the basis of the first-appearing reactant in the schedule that has been used in preparing the polymer.

G. Patents that claim merely vulcanizing, curing, or cross-linking or a polymer proper for this area, without the presence of a specified vulcanizing, curing, or cross-linking agent, or the amount of the chemical agent or the vulcanized, cured, or cross-linked product of such a reaction are classified on the basis of the first-appearing reactant in the schedule that has been polymerized in the preparing the polymer.

H. Patents that claim a polymer which is the result of a degradation of a polymer proper for this area, and wherein the degradation has been effected in the absence of any chemical agent, are classified on the basis of the initial first-appearing reactant in the schedule that has been polymerized in preparing the previously formed polymer that is degraded.

I. This class provides for a composition of a polymer proper for this class admixed with a broadly claimed nonreactant not identifiable by a chemical atom or amount; or for a process of preparing a composition wherein the nonreactant material is not identified by a chemical atom or amount and wherein the process of forming the composition recites no process condition other than mere polymerizing. (See Class 523, section I of the Class Definition, for a discussion of nonreactant materials and designated nonreactant materials.)

SECTION III - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

525, Synthetic Resins or Natural Rubbers, subclasses 242+ for products resulting from, or involving a polymer proper for this class reacted with an ethylenically unsaturated reactant.

SECTION IV - GLOSSARY

REACTANT

A reactant for purposes of this Class is a material which occurs in a polymer as a repeating unit and is present in at least three units. As used herein, reactant is meant to exclude catalyst residues, chain transfer agents, etc.

WITH

For purposes of this class, the term "with" under a specific reactant subclass requires the presence of the specific reactant with a different reactant which meets the parameters set forth by the "with" definition.

CONTAINS

For purposes of this class, the term "contains" under a specific reactant subclass includes the term "with" and merely requires the presence of the "contains" material. The required moiety, element, etc., may be in the specific reactant or in an additional reactant.

SUBCLASSES

1 This subclass is indented under subclass 1. Subject matter under Class 520, ... involving polymers derived from a plant-containing material of unknown constitution or processes of polymerizing; polymerizable compositions containing a plant material of unknown composition or processes of preparing.

(1) Note. The types of plant materials which are proper for this subclass are those whose composition and constitution are not sufficiently determined to enable their classification in the later subclasses on the basis of a particular reactant(s).

(2) Note. Types of materials included herein are nut shell liquors and essential oils. This subclass includes cashew nut shell liquor containing unseparated anacardic acid or Cardanol.

(3) Note. This subclass includes derivatives of plant materials which are undefinable as to chemical identity.

(4) Note. Materials which are substantially known as to chemical composition are excluded from this subclass or indents hereunder and are classified below in the schedule on the basis of the first specific reactant which is part of the chemical composition. If in any claim, any doubt exists as to whether a composition is of sufficient chemical identity so as to be classified as a specific reactant, then such doubt is to be resolved by classifying the claim as an original in this area and cross-referenced to the appropriate reactant subclass.

(5) Note. A chemical agent for purposes of this subclass is material which is added to solid polymer and causes or is present during a process wherein a chemical change of the solid polymer is effected.

SEE OR SEARCH THIS CLASS, SUBCLASS:

86+, for Cardanol, anacardic acid or derivative, tannins, or tannic acid, cresylic acid, or coal tar extracts as reactants.

2 This subclass is indented under subclass 1. Subject matter wherein material derived from a cashew plant and a sulfur-containing material are reactants.

3 This subclass is indented under subclass 1. Subject matter wherein material derived from a cashew plant and an aldehyde or derivative are reactants.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for the definition of the terms "aldehyde".

4 This subclass is indented under subclass 1. Subject matter under Class 520, ... involving polymer products derived from a boron-containing reactant wherein at least one atom of boron is bonded directly to a hydrogen or car-

bon atom or processes of polymerizing; polymerizable compositions containing as a reactant a compound of boron wherein boron is directly bonded to an atom of hydrogen or carbon or processes of preparing.

SEE OR SEARCH THIS CLASS, SUBCLASS:

480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also provide for processes of admixing with a broadly claimed nonreactant material.

SEE OR SEARCH CLASS:

526, Synthetic Resins or Natural Rubber, subclass 239 for a polymer derived from a boron-containing ethylenic reactant as sole monomer, or for a boron-containing interpolymer wherein all of the reactants used in preparing the polymer are ethylenically unsaturated.

5 This subclass is indented under subclass 4. Subject matter wherein the boron-containing reactant having a or bond also contains a silicon atom.

6 This subclass is indented under subclass 4. Subject matter wherein the boron-containing reactant having a or bond also contains a phosphorus atom.

7 This subclass is indented under subclass 4. Subject matter wherein the boron-containing reactant having a or bond also contains a nitrogen atom.

8 This subclass is indented under subclass 4. Subject matter wherein the boron-containing reactant having a or bond also contains at least one atom of oxygen directly bonded to the boron atom of the or containing moiety.

9 This subclass is indented under subclass 1. Subject matter under Class 520, ... , involving polymer products derived from a heavy metal or aluminum-containing reactant wherein at least one atom of a heavy metal or aluminum is bonded directly to an atom of hydrogen or carbon or processes of polymerizing; polymerizable compositions containing as a reactant a compound of a heavy metal or aluminum wherein the heavy metal or aluminum atom is directly bonded to a hydrogen or carbon atom or processes of preparing.

(1) Note. Heavy metal denotes a metal atom having a specific gravity greater than four.

SEE OR SEARCH THIS CLASS, SUBCLASS:

395, for a polymer derived from a heavy metal-or aluminum-containing reactant.

480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also provide for processes of admixing with a broadly claimed nonreactant material.

SEE OR SEARCH CLASS:

526, Synthetic Resins or Natural Rubbers, subclasses 240+ for a polymer derived from a metal-containing ethylenic reactant as sole monomer or for a metal-containing interpolymer wherein all of the reactants used in preparing the polymer are ethylenically unsaturated.

10 This subclass is indented under subclass 1. Subject matter under Class 520, ... , involving polymer products derived from a silicon-containing reactant wherein at least one atom of silicon is bonded directly to an atom of hydrogen or carbon or processes of polymerizing; polymerizable compositions containing as a reactant a compound of silicon wherein a silicon atom is directly bonded to a hydrogen or carbon atom or processes of preparing.

SEE OR SEARCH THIS CLASS, SUBCLASS:

480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also pro-

vide for processes of admixing with a broadly claimed nonreactant material.

SEE OR SEARCH CLASS:
526, Synthetic Resins or Natural Rubber, subclass 279 for a polymer derived from a silicon-containing ethylenic reactant as sole monomer or for a silicon-containing inter-polymer wherein all of the reactants used in preparing the polymer are ethylenically unsaturated.

12 This subclass is indented under subclass 10. Subject matter wherein a R3SiH or R3Si-CR3 reactant is polymerized in the presence of a specified material.

(1) Note. Silicones or polysiloxanes defined by the formula RnSiO wherein R is C or H are considered to be polymers and are proper for this area.

SEE OR SEARCH THIS CLASS, SUBCLASS:
33+, for organopolysiloxane used as reactants.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “specified material”.

13 This subclass is indented under subclass 12. Subject matter wherein the specified material is elemental boron or a boron-containing compound.

14 This subclass is indented under subclass 12. Subject matter wherein the specified material is an elemental metal or metal-containing compound.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “metals”.

15 This subclass is indented under subclass 14. Subject matter wherein the metal atom is a Group VIII metal atom (i.e., Fe, Co, Ni, Ru, Pd, Os, Ir, Pt, Rh).

16 This subclass is indented under subclass 14. Subject matter wherein the specified material contains a Group IIIA metal atom in elemental or compound form, i.e., Al, Ga, In, Ti.

17 This subclass is indented under subclass 14. Subject matter wherein the specified material contains a Group IVB metal atom in elemental or compound form, i.e., Ti, Zr, Hf.

18 This subclass is indented under subclass 14. Subject matter wherein the specified material contains a Group IVA metal atom in elemental or compound form, i.e., Ge, Sn, Pb.

19 This subclass is indented under subclass 14. Subject matter wherein the specified material contains a heavy metal atom in elemental or compound form.

(1) Note. Heavy metal denotes a metal atom having a specific gravity greater than four.

20 This subclass is indented under subclass 12. Subject matter wherein the specified material contains an ether, alcohol, or salt thereof.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the terms “ether” and “alcohol”.

21 This subclass is indented under subclass 12. Subject matter wherein the specified material is a nitrogen-containing compound.

22 This subclass is indented under subclass 21. Subject matter wherein silicon and nitrogen are part of the same compound.

23 This subclass is indented under subclass 12. Subject matter wherein the specified material contains at least one atom of phosphorus or sulfur.

24 This subclass is indented under subclass 12. Subject matter wherein the specified material contains a compound having at least one -O-O (peroxy) group.

25 This subclass is indented under subclass 10. Subject matter wherein a polymer has been derived from at least one or containing material and at least one reactant which is an organic compound and which organic compound is devoid of any silicon atom.

(1) Note. This subclass, for example, would include the reaction between two or containing reactants and at least one organic silicon-free reactant.

26 This subclass is indented under subclass 25. Subject matter wherein at least one silicon-free organic reactant contains a carboxylic acid group or is a derivative thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “carboxylic acid or derivative”.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “carboxylic acid or derivative”.

26.5 Reactant which is a fatty acid glycerol ester, a fatty acid or salt derived from a naturally occurring glyceride, tall oil, or a fatty acid derived from tall oil:
This subclass is indented under subclass 26. Subject matter wherein said silicon-free reactant is a fatty acid glycerol ester, a fatty acid or salt derived from a naturally occurring glyceride, tall oil, or a fatty acid derived from tall oil.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the definition of “fatty acid” in the Glossary for discussion of terms used herein.

27 This subclass is indented under subclass 25. Subject matter wherein at least one silicon-free organic reactant contains a heterocyclic ring.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “heterocyclic”.

28 This subclass is indented under subclass 25. Subject matter wherein at least one silicon-free organic reactant is a nitrogen-containing compound.

29 This subclass is indented under subclass 25. Subject matter wherein at least one silicon-free organic reactant is an alcohol or alcoholate thereof.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “alcohol”.

30 This subclass is indented under subclass 10. Subject matter wherein at least one or containing reactant having a polyvalent atom which is other than carbon, oxygen, or nitrogen (e.g., sulfur, phosphorus, etc.).

31 This subclass is indented under subclass 10. Subject matter wherein the silicon-containing reactant possesses at least one bond.

32 This subclass is indented under subclass 10. Subject matter wherein the containing reactant possesses at least one ethylenically unsaturated group.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “ethylenically unsaturated”.
526, Synthetic Resins or Natural Rubbers, subclass 279 for a polymer derived from an ethylenically unsaturated silicon-containing reactant as sole monomer or for a silicon-containing interpolymer wherein all of the reactants used in preparing the polymer are ethylenically unsaturated.

33 This subclass is indented under subclass 10. Subject matter wherein a containing reactant possesses at least two silicon atoms.

34 This subclass is indented under subclass 33. Subject matter wherein a containing compound possessing at least two silicon atoms is reacted with a silicon compound containing a single silicon atom.

35 This subclass is indented under subclass 33. Subject matter wherein at least two silicon atoms of a containing compound are joined by a single carbon atom, by a carbon chain, or by a chain composed only of carbon and oxygen atoms.

36 This subclass is indented under subclass 33. Subject matter wherein a containing compound with at least two silicon atoms contains a carbon-to-halogen bond and which carbon atom is not double bonded to an oxygen atom.

37 This subclass is indented under subclass 33. Subject matter wherein a containing compound possesses at least two silicon atoms with at least one silicon atom as ring member of a nonhetero-cyclic ring (e.g., cyclic trisiloxane, etc.).

SEE OR SEARCH THIS CLASS, SUBCLASS:

35, for a cyclic silicon reactant wherein two or more silicon atoms in the ring are joined by carbon atoms.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “heterocyclic”.

38 This subclass is indented under subclass 10. Subject matter wherein the containing reactant possesses at least one amino-nitrogen atom.

SEE OR SEARCH THIS CLASS, SUBCLASS:

41, for a nitrogen-containing and -Si-C- containing reactant wherein the nitrogen atom exists solely therein either as a carboxylic acid amide or as a carboxylic acid nitrile, (-C=N).

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “amine”.

39 This subclass is indented under subclass 10. Subject matter wherein a containing material is reacted with at least one silicon compound which is devoid of any bond (e.g., SiCl4, Si(OR)4, etc.).

SEE OR SEARCH THIS CLASS, SUBCLASS:

31, for the interaction of a Si-H containing compound and a silicon compound which is devoid of any silicon-carbon bond.

40 This subclass is indented under subclass 10. Subject matter wherein a containing compound contains at least one fused or bridged ring system or contains at least one ring composed solely of carbon atoms which is nonaromatic.

(1) Note. A bridged or fused ring system for purposes of this subclass requires that a given ring system be attached at two different nuclear atoms of its system to an atom or chain of atoms which, taken together with the two nuclear atoms, forms an additional ring structure.

41 This subclass is indented under subclass 10. Subject matter wherein the containing reactant contains at least one carboxylic acid group or is a derivative thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:

271, for an additional definition the “carboxylic acid”.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “carboxylic acid or derivative”.

42 This subclass is indented under subclass 10. Subject matter wherein the containing compound possesses a carbon-to-halogen bond and which carbon atom bonded to the halogen atom is other than as a carbonyl carbon atom (e.g., halo).

43 This subclass is indented under subclass 10. Subject matter wherein the containing reactant possesses at least one aromatic group therein.

44 This subclass is indented under subclass 1. Subject matter under Class 520 ... involving polymers derived from a reactant containing a -N=C=X group wherein X is a chalcogen atom

(i.e., O, S, Se, or Te) or processes of polymerizing; polymerizable compositions containing as a reactant a compound having the general formula R-N=C=X wherein X is a chalcogen or processes of preparing a polymerizable composition.

(1) Note. This subclass also provides for those functional derivatives of isocyanates which are generally known as blocked, masked, or hidden isocyanates. These materials are those which revert on heating to the -N=C=X group (e.g., urethanes or ureides of phenols, alkanols, lactams, oximes, etc.)

(2) Note. Where a -N=C=X group is produced by an in situ reaction or a decomposition reaction (other than blocked, masked, or hidden isocyanates), those patents have been placed as originals in subclasses which provide for the compound prior to its decomposition or on the basis of the reactants undergoing the in situ reaction (e.g., adiponitrile, carbonates, or oxalates).

(3) Note. Polonium is excluded from this subclass as being a chalcogen.

(4) Note. As used throughout this subclass any reference to X (e.g., -XH-C-XH, etc.) connotes oxygen, sulfur, selenium, or tellurium.

SEE OR SEARCH THIS CLASS, SUBCLASS:
370+,
480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also provide for processes of admixing with a broadly claimed nonreactant material.

45 This subclass is indented under subclass 44. Subject matter wherein at least one material having a -N=C=X group which has been rendered inert by conversion to an inactive group (e.g., blocked, masked, or hidden) is utilized as a reactant.

(1) Note. The reaction process usually involves heating the reactant which thereby reverts to a -N=C=X-containing reactant.

(2) Note. The -N=C=X group which has been rendered inert is usually in the form of a urethan group

48 This subclass is indented under subclass 44. Subject matter wherein a -N=C=X-containing reactant, wherein X is a chalcogen atom, i.e., O, S, Se, or Te, is polymerized in the presence of a specified material.

(1) Note. For purposes of this subclass, a compound having a single -C-XH, -C-NH_2 -C-NHR, or (X is chalcogen) is always considered to be a nonreactant. Similarly, a compound having a single group is considered as a nonreactant except where the compound is a fatty acid or salt derived from a naturally occurring glyceride, tall oil, or a fatty acid derived from tall oil, in which case, if the compound is a reactant it is considered proper for Class 528, subclass 74.5.

(2) Note. For purposes of this subclass a compound having two or more or (X is chalcogen) or combination of functional groups is always considered to be a reactant.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for an explanation of the term “specified material”.

49 This subclass is indented under subclass 48. Subject matter wherein the specified material contains a compound having a single C-XH, C-NH_2, C-NH-, or group (X is chalcogen).

50 This subclass is indented under subclass 48. Subject matter wherein the specified material contains a compound having at least one -O-O- group (i.e., peroxide, etc.).

51 This subclass is indented under subclass 48. Subject matter wherein the specified material contains at least one atom of phosphorus.

52 This subclass is indented under subclass 48. Subject matter wherein the specified material contains at least one nitrogen-containing organic compound.

53 This subclass is indented under subclass 52. Subject matter wherein the organic nitrogen-containing compound possesses at least one trivalent nitrogen atom which is bonded to three atoms of carbon i.e.,$(C)_3N$

54 This subclass is indented under subclass 53. Subject matter wherein the nitrogen compound whose nitrogen atom is bonded to three atoms of carbon, contains a fused- or bridged-ring system (e.g., triethylene diamine, etc.).

(1) Note. A bridged or fused ring system for purposes of this subclass requires that a ring system be attached at two different atoms of its nuclear skeleton to an atom or chain of atoms which, when taken together with the nuclear atoms, forms an additional ring structure.

55 This subclass is indented under subclass 48. Subject matter wherein the specified material contains at least one metal atom.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “metals”.

56 This subclass is indented under subclass 55. Subject matter wherein the specified material contains a transition metal atom.

(1) Note. Transition metal is limited to elements of atomic numbers 21-29, 39-47, 57-79, and 89 and higher, but does not include Zn, Cd, or Hg.

57 This subclass is indented under subclass 55. Subject matter wherein the specified material contains at least one atom of Group IA or Group IIA metal atom.

(1) Note. Group IA metal atoms are limited to Li, Na, K, Rb, Cs, Fr. Group IIA metal atoms are limited to Be, Mg, Ca, Sr, Ba, Ra.

58 This subclass is indented under subclass 55. Subject matter wherein the specified material contains tin (At. No. 50).

59 This subclass is indented under subclass 44. Subject matter wherein the -N=C=X (X is chalcogen) reactant contains at least two groups.

(1) Note. Patents for the most part herein are drawn to the after treatment of a liquid prepolymer having terminal -N=C=X groups.

(2) Note. The addition of materials to a prepolymer intermediate characterized by terms such as chain extenders, chain-lengthening material, cross-linking or curing agents, is not sufficient absent an amount of a material of chemical identity of added material (chemical identity is identical to what is required of a specified material).

(3) Note. For purposes of this subclass a carboxylic acid anhydride is considered as having two free carboxylic acid groups.

SEE OR SEARCH THIS CLASS, SUBCLASS:
67, through 85, for products and processes where a prepolymer is inherently prepared in an ongoing polymerization reaction and is subsequently modified, but where no intent has been made to recognize or identify the prepolymer intermediate.

60 This subclass is indented under subclass 59. Subject matter wherein a material containing at least one -N=C=X (X is chalcogen) group and two or more groups is reacted with a material which contains a compound having three or more -XH, NH, $-NH_2$, C=NH or groups or contains a compound having a combination of three or more of these groups.

(1) Note. In all cases each of the functional derivatives -XH, NH, $-NH_2$, C=NH, must be directly bonded to a carbon atom. It is permissible, however, for these functional derivatives to be bonded to different carbon atoms or to the same

carbon atom. A compound having three functional derivatives bonded to a single carbon atom meets the requirement of this subclass. An anhydride formed from two carboxylic acids is considered for purposes of this subclass as having two groups.

61 This subclass is indented under subclass 59. Subject matter wherein a material containing at least one -N=C=X (X is chalcogen) group and two or more groups is reacted with a compound which contains two nitrogen atoms as -NH, $-NH_2$, or =NH groups or a combination thereof.

(1) Note. In all cases each of the functional derivatives (i.e., -NH, =NH, or -NH2) must be directly bonded to different carbon atoms or to the same carbon atom. A single compound having two functional groups bonded to a single carbon atom meets the requirements of this subclass.

62 This subclass is indented under subclass 61. Subject matter wherein the reactant which contains two -NH, =NH, or -NH2 groups also contains a heterocyclic ring.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “heterocyclic”.

63 This subclass is indented under subclass 61. Subject matter wherein the -NH, NH2, or =NH reactant contains at least one halogen atom.

64 This subclass is indented under subclass 61. Subject matter wherein the -NH, NH2, or =NH reactant contains a cyclic ring is composed solely of carbon atoms.

65 This subclass is indented under subclass 59. Subject matter wherein a material containing at least one -N=C=X (X is chalcogen) group and two or more groups is reacted with a compound which has two -XH groups.

(1) Note. In all cases the -XH functional group must be directly bonded to a carbon atom. A single carbon atom may be bonded to more than one -XH group and such a compound would meet the requirements of this subclass.

(2) Note. The carbon atom bonded to the -XH group cannot be double to a chalcogen atom.

66 This subclass is indented under subclass 65. Subject matter wherein the reactant containing two -XH groups also contains at least two C-X-C or at least two carboxylic acid ester groups.

(1) Note. This subclass includes hydroxyl terminated polyesters or polyethers as reactants.

67 This subclass is indented under subclass 44. Subject matter wherein at least two reactants containing a -N=C=X (X is chalcogen) group are polymerized.

(1) Note. Excluded from this subclass are those conventional commercial compositions which are mixtures of toluene discoyanate (e.g., 2, 4 and 2, 6 TDi, 20/80 percent and 35/65 percent, etc.). However, mixtures of stereo and position isomers are included herein if proportions are recited.

68 This subclass is indented under subclass 44. Subject matter wherein a compound having at least one -N=C=X (X is chalcogen) group is reacted with at least one compound which contains two or more NH, $-NH_2$, or C=NH groups or a combination of two or more of these groups and wherein the NH, $-NH_2$, or C=NH group-containing reactant plus any other reactant is devoid of any group.

(1) Note. In all cases each of the functional derivatives, i.e., NH, C=NH, $-NH_2$, must be directly bonded to the same or different carbon atom. A compound having a single carbon atom which is bonded to more would than one $-NH_2$, >NH, or >C=NH group would meet the requirements of this subclass.

69 This subclass is indented under subclass 44. Subject matter wherein at least one reactant contains only one -N=C=X group (X is chalcogen).

70 This subclass is indented under subclass 44. Subject matter wherein at least one reactant contains flourine.

71 This subclass is indented under subclass 44. Subject matter wherein at least one reactant contains a salt group.

72 This subclass is indented under subclass 44. Subject matter wherein at least one contains phosphorus.

73 This subclass is indented under subclass 44. Subject matter wherein at least one reactant contains a heterocyclic ring.

(1) Note. Reactants are classified herein only if a positive recitation is noted that a reactant contains a heterocyclic group (e.g., reactants prepared from a heterocyclic material wherein the heterocyclic group has been destroyed would be classified elsewhere it is unambiguous from the specification of the patent that some heterocyclic group still exists in the reactant.

(2) Note. Included herein but not limited to the following examples are oxirane, aziridine, triazine, cyclic anhydrides, etc.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “heterocyclic”.

74 This subclass is indented under subclass 44. Subject matter wherein at least one reactant contains a fused or bridged ring system.

(1) Note. A bridged or fused ring system for purposes of this subclass requires that a ring system be attached at two different atoms of its nuclear skeleton to an atom or chain of atoms which when taken together with the nuclear atoms forms an additional ring structure.

74.5 Reactant which is a fatty acid glycerol ester, a fatty acid or salt derived from a naturally occurring glyceride tall oil, or a fatty acid derived from tall oil:
This subclass is indented under subclass 44. Subject matter wherein there is at least one reactant which is a fatty acid glycerol ester; a fatty acid or salt derived form a naturally occurring glyceride; or tall oil, or a fatty acid derived from tall oil.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the definition of “fatty acid” in the Glossary for a discussion of terms used herein.

75 This subclass is indented under subclass 44. Subject matter wherein at least one reactant contains an ethylenically unsaturated group.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “ethylenically unsaturated”.
526, Synthetic Resins or Natural Rubbers, subclass 288 and 310+, respectively, for a polymer derived from an ethylenically unsaturated -N=C=S or -N=C=O-containing reactant as sole monomer or for an interpolymer derived from only ethylenically unsaturated reactants wherein at least one of said reactants contains a -N=C=S or -N=C=O group.

76 This subclass is indented under subclass 44. Subject matter wherein a material containing two or more -N=C=X (X is chalcogen) groups is reacted with a compound having two or more or groups and wherein the carbon atoms bonded to oxygen or sulfur atom are not double bonded to any oxygen, selenium, or tellurium atom.

(1) Note. For purposes of this subclass a compound having the structure is considered as having two groups.

77 This subclass is indented under subclass 76. Subject matter wherein the or reactant contains at least three -XH groups.

(1) Note. In all cases the -XH functional group must be directly bonded to a carbon atom. A compound having a single

carbon atom which is bonded to three -XH groups would meet requirements of this subclass.

(2) Note. The carbon atom bonded to the -XH group cannot be double bonded to a chalcogen atom.

78 This subclass is indented under subclass 76. Subject matter wherein the or reactant contains at least one nitrogen atom which is other than C-NH, C-NH_2, or C=NH group.

(1) Note. This subclass includes tertiary amines.

79 This subclass is indented under subclass 76. Subject matter wherein the or reactant contains a cyclic ring which is composed soley of carbon atoms.

80 This subclass is indented under subclass 44. Subject matter wherein a material containing two or more -N=C=X (X is chalcogen) groups is reacted with a compound having two or more groups and which compound is devoid of any C-NH-, C=NH, or C-NH_2 groups.

(1) Note. In all cases the functional group must be bonded directly to a carbon atom. A compound having a single carbon atom which is bonded to two or more groups would meet the requirements of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

84, for (a) polymers derived from a reactant having two or more -N=C=X groups which reactant contains two or more groups and which contains at least one C-NH-, C-NH_2, or C=NH group, or (b) a polymer derived from a reactant having two or more -N=C=X groups and a reactant having a group.

81 This subclass is indented under subclass 80. Subject matter wherein the reactant contains at least three -XH groups.

(1) Note. In all cases the -XH groups must be bonded to a carbon atom. A compound having a carbon atom which is bonded to three or more -XH groups would meet the requirements of this subclass. The carbon atom bonded to the -XH group cannot be double bonded to a chalcogen atom.

82 This subclass is indented under subclass 80. Subject matter wherein the reactant contains at least one trivalent nitrogen atom which is bonded to three atoms of carbon.

83 This subclass is indented under subclass 80. Subject matter wherein the reactant has been derived from only a dicarboxylic acid or derivative and only a glycol or alcoholate derivative.

(1) Note. Included herein are mixtures of dicarboxylic acids and mixtures of glycols.

SEE OR SEARCH THIS CLASS, SUBCLASS:

271, for a definition of the term “dicarboxylic acid or derivative”.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “alcohol”.

84 This subclass is indented under subclass 44. Subject matter wherein a material containing two or more -N=C=X (X is chalcogen) groups is reacted with a compound having two or moregroups.

(1) Note. In all cases the functional group must be bonded directly to a carbon atom. A compound having a single carbon atom which is bonded to two or more groups would meet the requirements of this subclass.

(2) Note. For purposes of this subclass a compound having a group is considered as having twogroups and is considered proper for this subclass.

85 This subclass is indented under subclass 44. Subject matter wherein a material containing two or more -N=C=X (X is chalcogen) groups is reacted with a compound having two or more -XH groups.

(1) Note. In all cases the -XH functional group must be bonded directly to a carbon atom. A compound having a single carbon atom bonded to two or more -XH groups would meet the requirements of this subclass. The carbon atom bonded to the -XH group cannot be double bonded to a chalcogen atom.

86 This subclass is indented under subclass 1. Subject matter under Class 520, ... involving polymers derived from a phenol, phenol ether, inorganic phenolate and processes of polymerizing; polymerizable compositions containing a phenol, phenol ether, inorganic phenolate reactant and processes of preparing a polymerizable composition.

(1) Note.

(A)A phenol for purposes of this subclass requires one or more -OH groups directly bonded to a nuclear carbon atom of a substituted or unsubstituted benzene ring, which benzene ring can be an individual benzene ring or can be part of a polycyclic ring system.

(B)A phenol ether for purposes of this subclass requires one or more -O-C- groups wherein the oxygen atom of the -O-C- group is directly bonded to a nuclear carbon atom of a substituted or unsubstituted benzene ring and wherein the carbon atom of the -O-C- group is not double bonded to oxygen, sulfur, selenium, or tellurium or triple bonded to nitrogen. The benzene ring may be an individual benzene ring or may be part of a polycyclic ring system. The following examples of phenol ethers are within the definition set out above:

(1) The -O-C- group may itself be part of a cyclic ring system, e.g.,

, etc.

(2) The carbon of the -O-C- group may be a ring atom of a cyclic or

,etc.,

aromatic ring, e.g.,

(3) The carbon of the -O-C- group may be a terminal carbon atom, e.g.,

or may be the carbon atom of a chain, e.g.,

(C)An inorganic phenolate is an inorganic salt of a phenol (see phenol (1) above) wherein the hydrogen atom of a -OH

group is replaced by a metal or an inorganic group.

(2) Note. The term phenolic reactant as used throughout this subclass is intended to include the subject matter enumerated in the (1) Note above.

(3) Note. For purposes of this subclass tannin or tannic is considered to be a polyhydroxy polycyclic carboxy-containing phenol.

(4) Note. For purposes of this subclass cresylic acid is considered to be cresol.

(5) Note. For purposes of this subclass coal tar extracts are considered to be an indefinable mixture of ingredients some of which are phenolic in nature and are classified in this area on the basis of the coreactant, if any.

(6) Note. For purposes of this subclass, Cardanol and anacardic acids are considered to be phenols.

SEE OR SEARCH THIS CLASS, SUBCLASS:

1+, for a cashew nut shell liquor containing anacardic acid or Cardanol.

480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also provide for processes of admixing with a broadly claimed nonreactant material.

SEE OR SEARCH CLASS:

526, Synthetic Resins or Natural Rubbers, subclass 313 for a polymer derived from an ethylenically unsaturated phenol, phenol ether, or inorganic phenolate as sole monomer or as interpolymer derived from only ethylenically unsaturated reactants wherein at least one of the ethylenically unsaturated reactants contains a phenol, phenol ether, or inorganic phenolate group.

87 This subclass is indented under subclass 86. Subject matter wherein a polymer contains both a phenol, phenol ether, or inorganic phenolate group and at least one 1, 2-epoxy group, or wherein a phenol, phenol ether, or inorganic phenolate-containing material is reacted with a 1, 2-epoxy-containing material.

(1) Note. A 1, 2-epoxy-containing material is a compound having a three-membered heterocyclic ring composed only of one oxygen and two carbon atoms.

88 This subclass is indented under subclass 87. Subject matter wherein a phenol, phenol ether, or inorganic phenolate which contains at least one 1, 2-epoxy is polymerized in the presence of a specified material, or wherein a phenol, phenol ether, or inorganic phenolate is polymerized with a 1, 2-epoxy-containing reactant in the presence of a specified material.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “specified material”.

89 This subclass is indented under subclass 88. Subject matter wherein the specified material contains phosphorus atom(s).

90 This subclass is indented under subclass 88. Subject matter wherein the specified material contains sulfur atom(s).

91 This subclass is indented under subclass 88. Subject matter wherein the specified material contains boron atom(s).

92 This subclass is indented under subclass 88. Subject matter wherein the specified material contains a polyvalent metal atom.

(1) Note. Polyvalent material is limited to elements of atomic numbers 4, 12, 13, 20-33, 38-51, 56-84, 88, and higher.

93 This subclass is indented under subclass 88. Subject matter wherein the specified material contains a nitrogen compound.

94 This subclass is indented under subclass 93. Subject matter wherein the specified material contains a nitrogen atom as part of a heterocyclic ring.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “heterocyclic”.

95 This subclass is indented under subclass 88. Subject matter wherein the specified material contains a Group IA metal atom, i.e., Li, Na, K, Rb, Cs, Fr.

(1) Note. Included herein are those substances classified as caustics.

96 This subclass is indented under subclass 87. Subject matter wherein the phenol, phenol ether, or inorganic phenolate reactant contains at least one heterocyclic group which is not a 1, 2-epoxy-containing ring.

SEE OR SEARCH THIS CLASS, SUBCLASS:

101, for a phenol, phenol ether, or inorganic phenolate containing as the sole heterocyclic ring a 1, 2-epoxy group fused to a carbocyclic ring.

105, for a phenol, phenol ether, or inorganic phenolate reactant containing only a single 1, 2-epoxy group.

SEE OR SEARCH CLASS:

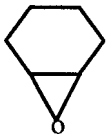
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “heterocyclic”.

97 This subclass is indented under subclass 87. Subject matter wherein the phenol, phenol ether, or inorganic phenolate reactant contains a fused or bridged structure, which fused structure is other than a 1, 2-epoxy ring which is fused to a ring system containing only carbon atoms as ring members.

(1) Note. Fused or bridged ring for purposes of this subclass requires that a ring system be attached at two different atoms of its nuclear skeleton to an atom or chain of atoms which, when taken together with the nuclear atoms, forms an additional ring system.

98 This subclass is indented under subclass 87. Subject matter wherein the phenol, phenol ether, or inorganic phenolate contains at least three rings and wherein each of said rings is composed solely of carbon atoms.

(1) Note. For purposes of this subclass a ring containing only carbon atoms wherein a 1, 2-epoxy group is fused directly thereto is considered as being a single ring, e.g.,



, etc.

99 This subclass is indented under subclass 87. Subject matter wherein the phenolic reactant contains at least one nitrogen, sulfur, or phosphorus atom.

100 This subclass is indented under subclass 87. Subject matter wherein the phenol, phenol ether, or inorganic phenolate reactant contains a carboxylic acid group or is a derivative thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:

96, for a cyclic anhydride, lactone, lactam, or imide-containing phenol, phenol ether, or inorganic phenolate reactant.

271, for an explanation of the term “carboxylic acid derivative”.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “carboxylic acid”.

101 This subclass is indented under subclass 87. Subject matter wherein the phenol, phenol ether, or inorganic phenolate reactant contains (1) ethylenic unsaturation, or (2) contains at least one 1, 2-epoxy group fused to a ring composed solely of carbon atoms.

(1) Note. A fused ring monomer for purposes of this subclass requires that a ring composed solely of carbon atoms be attached at two of its adjacent nuclear carbon atoms to a single oxygen atom so that the adjoined carbons and the oxygen atom form an additional ring structure.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “ethylenically unsaturated”.

102 This subclass is indented under subclass 87. Subject matter wherein at least one halogen atom is bonded directly to a nuclear carbon atom of a benzene ring and wherein at least one of the nuclear carbon atoms of the same benzene ring is directly bonded to an oxygen atom so as to form a phenol, phenol ether, or inorganic phenolate.

103 This subclass is indented under subclass 87. Subject matter wherein two or more 1, 2-epoxy-containing compounds are reactants.

(1) Note. This subclass includes:

(a)Two or more epoxy-containing phenols, phenol ethers, or inorganic phenolates or mixtures thereof.

(b)A 1, 2-epoxy-containing phenol, phenol ether, or inorganic phenolate reacted with a nonphenolic-containing 1, 2-epoxy reactant.

(c)A nonepoxy-containing phenolic material reacted with two or more nonphenolic 1, 2-epoxy-containing reactants.

103.5 1, 2-epoxy reactant having at least one carboxylic ester group, e.g., eposidized linseed oil, etc.:
This subclass is indented under subclass 103. Subject matter wherein at least one 1, 2-epoxy reactant contains one or more carboxylic acid ester groups.

104 This subclass is indented under subclass 87. Subject matter wherein two or more phenols, phenol ethers, or inorganic phenolates or mixtures thereof are reactants.

105 This subclass is indented under subclass 87. Subject matter wherein a phenol, phenol ether, or inorganic phenolate reactant contains only a single 1, 2-epoxy group therein.

SEE OR SEARCH THIS CLASS, SUBCLASS:
103, for the interaction of two or more phenolic reactants each containing a single 1, 2-epoxy group.

106 This subclass is indented under subclass 87. Subject matter wherein a phenol, phenol ether, or inorganic phenolate containing two or more 1, 2-epoxy groups is reacted with a non-1, 2-epoxy-containing reactant (reactant is devoid of 1, 2-epoxy group), or wherein a non-1, 2-epoxy-containing phenol, phenol ether, or inorganic phenolate (phenolic material is devoid of a 1, 2-epoxy group) is reacted with a single compound having a 1, 2-epoxy group and with at least one non-1, 2-epoxy-containing reactant (reactant is devoid of a 1, 2-epoxy group).

SEE OR SEARCH THIS CLASS, SUBCLASS:
103, for two or more 1, 2-epoxy reactants.
104, for two or more phenolic reactants.

107 This subclass is indented under subclass 106. Subject matter wherein the non-1, 2-epoxy or nonphenolic reactant is an aldehyde or derivative.

SEE OR SEARCH THIS CLASS, SUBCLASS:
230, for a clarification of the term “aldehyde derivative”.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “aldehyde”.

108 This subclass is indented under subclass 106. Subject matter wherein the non-1, 2-epoxy or nonphenolic reactant contains phosphorus.

109 This subclass is indented under subclass 106. Subject matter wherein the non-1, 2-epoxy or nonphenolic reactant contains sulfur.

110 This subclass is indented under subclass 106. Subject matter wherein the non-1, 2-epoxy or nonphenolic reactant is an alcohol, oxygen ether, or inorganic alcoholate.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the terms “alcohol” and “ether”.

111 This subclass is indented under subclass 110. Subject matter wherein the non-1, 2-epoxy or nonphenolic reactant is a nitrogen-containing alcohol, inorganic alcoholate of a nitrogen-containing alcohol, or a nitrogen-containing oxygen ether.

111.3 Non-1, 2-epoxy or nonphenolic reactant which is a dimer or trimer of an ethylenically unsaturated aliphatic monocarboxylic acid having at least ten atoms; or adduct of said unsaturated monocarboxylic acid with an alpha, beta ethylenically unsaturated carboxylic acid or derivative:
This subclass is indented under subclass 106. Subject matter wherein said nonepoxy or nonphenolic reactant is polycarboxylic acid reactant which is a dimer or trimer of an ethylenically unsaturated aliphatic noncarboxylic acid having at least ten carbon atoms; or an adduct of said unsaturated monocarboxylic unsaturated carboxylic acid or derivative.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of "dimer or trimer or an aliphatic monocarboxylic acid".

111.5 Non 1, 2-epoxy or nonphenolic reactant which is a fatty acid glycerol ester, a fatty acid or salt derived from a naturally occurring glyceride, tall oil, or a fatty acid derived from tall oil:

This subclass is indented under subclass 106. Subject matter wherein said non 1, 2-epoxy or nonphenolic reactant is a fatty acid glycerol ester, a fatty acid or salt derived from a naturally occurring glyceride, tall oil, or fatty acid drived from tall oil.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the definition of "fatty acid" in the Glossary for a discussion of terms used herein.

112 This subclass is indented under subclass 106. Subject matter wherein the non-1, 2-epoxy or nonphenolic reactant is a carboxylic acid, salt thereof, or anhydride thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:
271, for a definition of the term "carboxylic acid salt or anhydride".

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "carboxylic acid".

113 This subclass is indented under subclass 112. Subject matter wherein in addition to the carboxylic acid, salt thereof, or anhydride thereof, there is at least one additional non-1, 2-epoxy or nonphenolic reactant which is a nitrogen-containing compound.

(1) Note. This subclass may include a mixture of two nonepoxy or nonphenolic reactants wherein one is a nitrogen-containing carboxylic acid and wherein the other is a non-nitrogen-containing carboxylic acid.

114 This subclass is indented under subclass 112. Subject matter wherein the non-1, 2-epoxy or nonphenolic reactant is a nitrogen-containing carboxylic acid, a salt of a nitrogen-containing carboxylic acid, a nitrogen-containing carboxylic acid anhydride, or a nitrogen-containing salt of a non-nitrogen-containing carboxylic acid.

115 This subclass is indented under subclass 112. Subject matter wherein the non-1, 2-epoxy or nonphenolic reactant is at least a mixture of two or more carboxylic acids, salts thereof, anhydrides thereof, or is a mixture of at least any two of the types of materials enumerated above.

116 This subclass is indented under subclass 106. Subject matter wherein the non-1, 2-epoxy or nonphenolic reactant is a heterocyclic ring-containing compound.

SEE OR SEARCH THIS CLASS, SUBCLASS:
112, for a non-1, 2-epoxy or nonphenolic reactant containing a cyclic carboxylic acid anhydride group.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "heterocyclic".

117 This subclass is indented under subclass 116. Subject matter wherein the non-1, 2-epoxy or nonpenolic reactant contains a five-membered heterocyclic ring having at least one nitrogen atom as a ring member.

118 This subclass is indented under subclass 116. Subject matter wherein the non-1, 2-epoxy or nonphenolic reactant contains a six-membered heterocyclic ring having at least one nitrogen atom as a ring member.

119 This subclass is indented under subclass 106. Subject matter wherein the non-1, 2-epoxy or nonphenolic reactant contains at least one atom of nitrogen.

120 This subclass is indented under subclass 119. Subject matter wherein the non-1, 2-epoxy or nonphenolic material contains at least two nitrogen-containing reactants.

SEE OR SEARCH THIS CLASS, SUBCLASS:
99, for a nitrogen-containing phenolic reactant.

121 This subclass is indented under subclass 119. Subject matter wherein the nitrogen-containing non-1, 2-epoxy or nonphenolic reactant contains an amino-nitrogen atom.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “amine”.

122 This subclass is indented under subclass 121. Subject matter wherein the non-1, 2-epoxy or nonphenlic reactant which has an amino-nitrogen atom contains a non-aromatic ring composed solely of carbon atoms.

123 This subclass is indented under subclass 121. Subject matter wherein the non-1, 2-epoxy or nonphenolic reactant which has an amino-nitrogen atom contains at least three nitrogen atoms.

(1) Note. In counting the number of nitrogen atoms, the nonamino groups are counted toward the number of nitrogen atoms required to meet the requisite number of three or more nitrogen atoms.

124 This subclass is indented under subclass 121. Subject matter wherein the non-1, 2-epoxy or nonphenolic reactant which contains an amino-nitrogen atom contains at least one aromatic ring.

125 This subclass is indented under subclass 86. Subject matter wherein a polymer is derived from a phenol, phenol ether, or inorganic phenolate which contains a ketone group or wherein a phenol, phenol ether, or inorganic phenolate-containing material is reacted with a ketone-containing material.

(1) Note. For purposes of this subclass a reactant having a C=C=O group (a ketene) is considered as being a ketone.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “ketone”.

126 This subclass is indented under subclass 125. Subject matter wherein a phenol, phenol ether, or inorganic phenolate which contains at least one ketone group is polymerized in the presence of a specified material, or wherein a phenol, phenol ether, or inorganic phenolate is polymerized with at least one ketone-containing reactant in the presence of a specified material.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for an explanation of the term “specified material”.

127 This subclass is indented under subclass 125. Subject matter wherein at least one phenol, phenol ether, or inorganic phenolate containing a ketone group is reacted with an aldehyde or derivative which is free of any ketone or phenolic group, or wherein a phenol, phenol ether, or inorganic phenolate is reacted with a ketone-containing reactant and with an aldehyde or derivative which is devoid of any phenolic or ketone groups.

SEE OR SEARCH THIS CLASS, SUBCLASS:
230, for a definition of the term “aldehyde derivative”, and see the (2) Note thereunder.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for definition of the term “aldehyde”.

128 This subclass is indented under subclass 125. Subject matter wherein a phenol, phenol ether, or inorganic phenolate is reacted with at least one ketone reactant which is devoid of any phenolic group.

129 This subclass is indented under subclass 86. Subject matter wherein a polymer is derived from at least one phenol, phenol ether, or inorganic phenolate and at least one aldehyde or derivative.

(1) Note. (a) An aldehyde derivative is:

(1)Compounds having a X-CH2-OH group wherein X is other than a carbon or hydrogen (e.g., paraformaldehyde, methyol derivatives of urea, etc.).

(2)Heterocyclic compound having only carbon and oxygen as ring members in an alternating manner and in equal amount, i.e., as illustrated below, e.g., trioxane.

(3)Hexamethylenetramine (CH2)6N4, known also as methenamine, hexamine, formine, hexamethyleneamine, and urotropin and its derivatives. A derivative for purposes of this subclass requires the basic ring structure of hexamethylenetetramine but wherein the hydrogen atoms may have been replaced by other atoms. See illustration below.

(2) Note. Compounds having a -CH2OH group bonded to elements other then C, H, or oxygen are regarded as being two compounds; for instance, a methylol derivative of melamine is regarded as a mixture of melamine and formaldehyde, and methylol urea is regarded as being a mixture of urea and formaldehyde.

(3) Note. An unspecified novolak or resole is proper for this area in that it is a mixture of a phenol and an aldehyde. If a novolak or resole of specified structure is claimed as a reactant, then classification is proper based on the structure of the specific reactant.

(4) Note. For purposes of this subclass, a reactant composed of only halogen and carbon atoms is considered as being a halogenated carbon and is therefore proper for subclass 160.

SEE OR SEARCH THIS CLASS, SUBCLASS:

480+, for cross-references placed therein when liquid novolak or resole is utilized as a reactant in the subclass or its indents. Such liquid reactants are regarded as solids for purposes of cross-references.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “aldehyde”.

137 This subclass is indented under subclass 129. Subject matter wherein a phenol, phenol ether, or inorganic phenolate is reacted with at least one aldehyde or derivative in the presence of a specified material.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for an explanation of the term “specified material”.

138 This subclass is indented under subclass 137. Subject matter wherein the specified material contains at least one atom of boron.

139 This subclass is indented under subclass 137. Subject matter wherein the specified material contains at least one atom of aluminum or of a heavy metal.

(1) Note. Heavy metal denotes a metal atom having a specific gravity greater than four.

140 This subclass is indented under subclass 137. Subject matter wherein the specified material contains at least one atom of a Group IIA metal (i.e., Be, Mg, Ca, Sr, Ba).

SEE OR SEARCH THIS CLASS, SUBCLASS:
139, for a radium-containing specified material.

141 This subclass is indented under subclass 137. Subject matter wherein the specified material contains at least one atom of phosphorus.

142 This subclass is indented under subclass 137. Subject matter wherein the specified material is an alcohol, inorganic alcoholate thereof, or ether.

SEE OR SEARCH THIS CLASS, SUBCLASS:
139, for an inorganic alcoholate containing aluminum or a heavy metal atom.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the terms “alcohol” or “ether”.

143 This subclass is indented under subclass 137. Subject matter wherein the specified material contains at least one atom of sulfur.

144 This subclass is indented under subclass 137. Subject matter wherein the specified material is a carboxylic acid, ester thereof, salt thereof, or anhydride thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:
271, for a definition of the term “ carboxylic acid salt or anhydride”.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “carboxylic acid or derivative”.

145 This subclass is indented under subclass 137. Subject matter wherein the specified material is a nitrogen-containing compound.

146 This subclass is indented under subclass 145. Subject matter wherein the nitrogen-containing specified material contains at least one atom of nitrogen directly bonded to at least one atom of carbon.

147 This subclass is indented under subclass 137. Subject matter wherein the specified material contains at least one atom of a Group IA metal (i.e., Li, Na, K, Rb, Cs, Fr).

(1) Note. The term “caustic or alkali” in a claim is sufficient for a material to be considered as a specified material.

SEE OR SEARCH THIS CLASS, SUBCLASS:
139, for a specified material containing radium.

148 This subclass is indented under subclass 129. Subject matter wherein a phenol, phenol ether, or inorganic phenolate containing a carboxylic acid group or a salt of a carboxylic acid group is reacted with an aldehyde or derivative.

SEE OR SEARCH THIS CLASS, SUBCLASS:
271, for a definition of the term “ carboxylic acid salt”.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “carboxylic acid or derivative”.

149 This subclass is indented under subclass 129. Subject matter wherein a phenol, inorganic phenolate, or phenol ether containing at least one nitrogen atom is reacted with an aldehyde or derivative.

150 This subclass is indented under subclass 129. Subject matter wherein a phenol, inorganic phenolate, or phenol ether containing at least one sulfur atom is reacted with an aldehyde or derivative.

151 This subclass is indented under subclass 129. Subject matter wherein a phenol, inorganic phenolate, or phenol ether containing at least one halogen atom which is bonded to a nuclear carbon atom of a benzene ring and wherein at least one of the other nuclear carbon atoms of the same benzene ring is directly bonded to an oxygen atom so as to form a phenol, inorganic phenolate, or phenol ether therewith, is reacted with an aldehyde or derivative.

152 This subclass is indented under subclass 129. Subject matter wherein a phenol, inorganic phenolate, or phenol ether containing at least one ethylenically unsaturated group is reacted with at least one aldehyde or derivative.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "ethylenically unsaturated".
526, Synthetic Resins or Natural Rubbers, subclass 313, wherein an ethylenically unsaturated phenol, inorganic phenolate, or phenol ether is the sole reactant, or wherein all of the reactants are ethylenically unsaturated.

153 This subclass is indented under subclass 129. Subject matter wherein a phenol, inorganic phenolate, or phenol ether containing a fused or bridged ring or containing two or more individual rings is reacted with an aldehyde or derivative.

(1) Note. Included within the term "two or more individual rings" may be a phenolic reactant containing a heterocyclic ring or cycloaliphatic ring in addition to the phenolic structure, or a phenolic reactant containing two phenolic rings (e.g., diphenyl ether, etc.) or a phenolic reactant containing an aryl ring in addition to the phenolic ring.

SEE OR SEARCH THIS CLASS, SUBCLASS:
154, for a phenol ether reactant wherein the ether group is not bonded to two distinct benzene rings.

154 This subclass is indented under subclass 129. Subject matter wherein a phenol ether is reacted with an aldehyde or derivative.

155 This subclass is indented under subclass 129. Subject matter wherein an aldehyde (1) is reacted with a phenol containing two distinct (-OH) groups or two distinct (-O-Salt) groups or mixtures of these groups and wherein the two (-OH) groups or two (-O-Salt) groups are bonded to two distinct carbon atoms of the same benzene ring, or (2) is reacted with two or more phenolic compounds to their phenolate salts or mixtures thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:
153, for a phenolic reactant containing two distinct benzene rings and containing at least one (-OH) or (-O-Salt) group bonded to a nuclear carbon atom of a benzene ring.

156 This subclass is indented under subclass 129. Subject matter wherein a phenol or inorganic phenolate is reacted with at least two distinct aldehydes or derivatives or mixtures thereof.

157 This subclass is indented under subclass 129. Subject matter wherein a phenol or inorganic phenolate is reacted with an ethylenically unsaturated aldehyde or derivative.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "ethylenically unsaturated".
526, Synthetic Resins or Natural Rubbers, subclass 315 for polymers wherein an ethylenically unsaturated aldehyde is the sole reactant.

158 This subclass is indented under subclass 129. Subject matter wherein a phenol or inorganic phenolate is reacted with at least one aldehyde or derivative and at least one additional phosphorus or sulfur-containing reactant which sulfur or phosphorus reactant is not a phenol, inorganic phenolate, or aldehyde or derivative thereof.

158.5 With a reactant which is a fatty acid glycerol ester, a fatty acid or salt derived from a naturally occurring glyceride, tall oil, or a fatty acid derived from a tall oil:
This subclass is indented under subclass 129. Subject matter wherein there is additionally present a fatty acid glycerol ester, a fatty acid or salt derived from a naturally occurring glyceride, tall oil, or a fatty acid derived from tall oil.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the definition of "fatty acid" in the Glossary for a discussion of terms used herein.

159 This subclass is indented under subclass 129. Subject matter wherein a phenol or phenolate is reacted with an aldehyde or derivative thereof and with an additional ethylenically unsaturated reactant.

SEE OR SEARCH THIS CLASS, SUBCLASS:

152, for the reaction of an ethylenically unsaturated phenolic reactant and an aldehyde or derivative.

157, for the reaction of a phenolic reactant and an ethylenically unsaturated aldehyde or derivative.

160 This subclass is indented under subclass 129. Subject matter wherein a phenol or inorganic phenolate is reacted with an aldehyde or derivative and with an additional reactant which is solely composed of carbon and hydrogen atoms, or solely composed of only carbon, hydrogen, and halogen atoms.

(1) Note. For purposes of this subclass a reactant containing only carbon and halogen atoms (i.e., perhalo) will be considered as being proper for classification herein.

161 This subclass is indented under subclass 129. Subject matter wherein a phenol or inorganic phenolate is reacted with at least one aldehyde or derivative and with an additional reactant which is a carboxylic acid, salt, or a carboxylic acid anhydride and which reactant is not a phenol, inorganic phenolate, or an aldehyde or a derivative thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:

148, for a phenolic reactant containing a carboxylic acid or carboxylic acid salt group.

271, for a definition of the term "carboxylic acid salt or anhydride".

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "carboxylic acid".

162 This subclass is indented under subclass 129. Subject matter wherein a phenol or inorganic phenolate is reacted with an aldehyde or derivative and with at least one additional reactant which contains at least one nitrogen atom which is not a phenol, inorganic phenolate, or an aldehyde or derivative.

SEE OR SEARCH THIS CLASS, SUBCLASS:

149, for a nitrogen-containing phenolic reactant.

163 This subclass is indented under subclass 162. Subject matter wherein the nonphenolic or nonaldehyde or derivative nitrogen reactant (1) contains at least one atom of nitrogen as a ring atom of a heterocyclic ring, or (2) is a compound having at least one nitrogen atom and at least one aromatic ring.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "heterocyclic".

164 This subclass is indented under subclass 162. Subject matter wherein the nonphenolic or nonaldehyde or derivative nitrogen reactant contains the group.

SEE OR SEARCH THIS CLASS, SUBCLASS:

158, for a nonphenolic or nonaldehyde reactant containing the N-C-N group.

165 This subclass is indented under subclass 129. Subject matter wherein the sole reactants are a phenol or inorganic phenolate and an aldehyde or derivative.

SEE OR SEARCH THIS CLASS, SUBCLASS:

155, for a polymer from two or more phenolic reactants and at least one aldehyde or derivative.

156, for a polymer from a single phenolic reactant and two or more aldehydes or derivatives.

166 This subclass is indented under subclass 86. Subject matter wherein a polymer is derived (1) from phenol, phenol ether, or inorganic phenolate reactant containing an aluminum or heavy metal atom, or (2) from a phenol, inorganic phenolate, or phenol ether and an aluminum or heavy metal-containing reactant.

(1) Note. Heavy metal denotes a metal atom having a specific gravity greater than four.

SEE OR SEARCH THIS CLASS, SUBCLASS:

9, for a heavy metal or aluminum reactant having at least one hydrogen to heavy metal or aluminum bond or at least one carbon to heavy metal or aluminum bond.

167 This subclass is indented under subclass 86. Subject matter wherein a polymer is derived (1) from a phenol, phenol ether, or inorganic phenolate reactant containing at least one atom of phosphorus, or (2) from a phenol, phenol ether, or inorganic phenolate and a phosphorus-containing reactant.

168 This subclass is indented under subclass 167. Subject matter wherein a nitrogen-containing compound is a reactant.

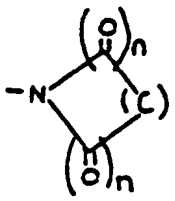
(1) Note. The nitrogen atom may be in any of the reactants and the phosphorus atom may be in any of the other reactants, or they may be in the same nonphenolic reactant, or in the same phenolic reactant.

169 This subclass is indented under subclass 167. Subject matter wherein a halogen-containing compound is a reactant.

(1) Note. The halogen atom may be in any of the reactants and the phosphorus atom may be in any of the other reactants, or they may be in the same nonphenolic reactant, or in the same phenolic reactant.

170 This subclass is indented under subclass 86. Subject matter wherein a polymer is derived (1) from a phenol, phenol ether, or inorganic phenolate containing at least one imide group, or (2) from a phenol, phenol ether, or inorganic phenolate and an imide-containing reactant.

(1) Note. An imide for purposes of this subclass is a compound having the general formula, as shown below, wherein X is one or more.



171 This subclass is indented under subclass 86. Subject matter wherein a polymer is derived (1) from a phenol, phenol ether, or inorganic phenolate containing a sulfur-to-oxygen bond, or (2) from a phenol, phenol ether, or an inorganic phenolate and a reactant which contains a sulfur-to-oxygen bond.

172 This subclass is indented under subclass 171. Subject matter wherein a nitrogen-containing compound is a reactant and wherein the nitrogen atom is other than solely as the nitrogen atom of a carboxylic acid derivative, i.e., amide, nitrile, or lactam.

(1) Note. The nitrogen atom may be in any of the reactants (other than solely as carboxylic acid derivatives) and the sulfur-to-oxygen group may be in any of the other reactants, or they may be in the same nonphenolic reactant, or in the same phenolic reactant.

SEE OR SEARCH THIS CLASS, SUBCLASS:

170, for a phenolic reactant containing an imide group, or for the reaction of a phenolic reactant and an amide-containing reactant.

173, for a reactant wherein nitrogen is solely part of a carboxylic acid amide, nitrile, or lactam.

271, for a definition of a carboxylic acid derivative.

173 This subclass is indented under subclass 171. Subject matter wherein a carboxylic acid or derivative is a reactant.

(1) Note. A derivative of a carboxylic acid for purposes of this class is limited to esters, amides, imides, lactams, salts, anhydrides, nitriles, lactones, and acyl halides.

(2) Note. The carboxylic acid or derivative may be in any one of the reactants and the sulfur-to-oxygen bond may be in any of the other reactants, or they may be in the same phenolic or nonphenolic reactant.

SEE OR SEARCH THIS CLASS, SUBCLASS:
170, for imides.
271, for a definition of the term "carboxylic acid or derivative thereof".

174 This subclass is indented under subclass 171. Subject matter wherein a reactant contains a halogen-containing material (F, Cl, Br, I, At) as a reactant.

(1) Note. The halogen atom may be in any of the reactants and the sulfur-to-oxygen group may be in any of the other reactants, or they may be in the same nonphenolic reactant, or in the same phenolic reactant.

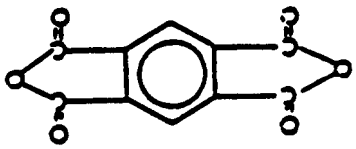
175 This subclass is indented under subclass 174. Subject matter wherein a reactant contains the halo group.

176 This subclass is indented under subclass 86. Subject matter wherein a phenol, phenol ether, or inorganic phenolate is reacted with a polycarboxylic acid or derivative thereof.

(1) Note. "Derivative" is limited to a nitrile, ester, anhydride, salt, amide, imide, lactam, lactone, and acyl halide. Certain compounds, however, may have more than one function (e.g., a lactone is a species of ester; a lactam isa species of an amide). Compounds which are multifaceted (i.e., more than one function) are classified on the basis of the first-appearing term provided in the subclass hierarchy.

(2) Note. A polycarboxylic acid reactant for purposes of this subclass requires the presence of at least two carboxylic acid groups. A polycarboxylic acid derivative requires at least one carboxylic acid group and at least one carboxylic acid derivative, or at least two identical carboxylic acid derivatives, or at least two different carboxylic acid derivatives. See (1) Note above for an explanation of the term "derivative".

(4) Note. For purposes of this subclass an anhydride having the general formula, which may be linear or cyclic, is considered as being a polycarboxylic acid. Compounds having both a anhydride and a free carboxylic acid group are considered as being a tricarboxylic acid, e.g., as shown below in the first illustration, etc., and compounds containing two anhydride groups are considered as being a tetracarboxylic acid, e.g., as shown below in the second illustration.



SEE OR SEARCH THIS CLASS, SUBCLASS:
170, for the reaction of an imide-containing phenolic reactant or for the reac-

tion of a phenolic reactant with an imide-containing reactant.

271, for a more specific definition of the term “carboxylic acid derivative”.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “carboxylic acid”.

179 This subclass is indented under subclass 176. Subject matter wherein a phenol, phenol ether, or inorganic phenolate is reacted with at least one reactant which is a polycarboxylic acid or polycarboxylic acid derivative in the presence of a specified material.

(1) Note.

(A)For purposes of this subclass non-reactant materials (specified materials) which are present during a polymerization reaction and wherein the only metal atoms therein are Group IA (Li, Na, K, Rb, Cs, Fr) or Group IIA metal atoms (Be, Mg, Ca, Sr, Ba, Ra) or a mixture thereof, are not considered as being specified materials.

(B) Compounds which contain at least one Group IA or Group IIA and at least one other non-Group IA or non-Group IIA metal atom are proper herein and are classified on the basis of the non-Group IA or non-Group IIA metal atom.

(C)A mixture of a metal-containing compound specifically excluded herefrom and another material which can be considered as being a specified material, per se, is classified herein on the basis of specified material, per se.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for an explanation of the term “specified material”.

180 This subclass is indented under subclass 179. Subject matter wherein the specified material contains at least one metal atom.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for the definition of “metals”.

181 This subclass is indented under subclass 180. Subject matter wherein the specified material contains at least one atom of a transition metal.

(1) Note. Transition metal is limited to elements of atomic numbers 21-29, 39-47, 57-79, 88, and higher.

182 This subclass is indented under subclass 179. Subject matter wherein the specified material is a nitrogen-containing compound.

183 This subclass is indented under subclass 176. Subject matter wherein a nitrogen-containing compound is a reactant and wherein at least one nitrogen atom thereof is an amino-nitrogen atom.

(1) Note. The amino-nitrogen atom may be in any of the reactants, for instance, it may be in the phenolic reactant or in the polycarboxylic acid or derivative reactant, or in a nonphenolic or nonpolycarboxylic reactant.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for the definition of the term “amine”.

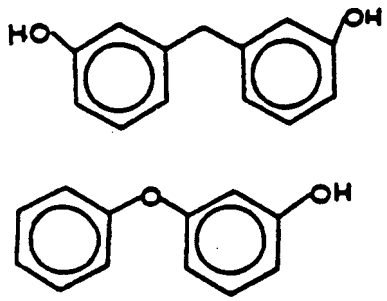
184 This subclass is indented under subclass 183. Subject matter wherein a reactant contains both a carboxylic acid group or derivative thereof and at least one amino-nitrogen atom.

SEE OR SEARCH THIS CLASS, SUBCLASS:

188, for a non(amino nitrogen)-containing tricarboxylic acid or non(amino nitrogen)-containing derivative of a tricarboxylic acid (e.g., amide, nitrile, etc.).

185 This subclass is indented under subclass 183. Subject matter wherein a phenolic reactant contains two or more oxygen atoms directly bonded to two distinct aryl nuclear carbon atoms of two distinct aryl rings and wherein the bonded oxygen atoms form two distinct phe-

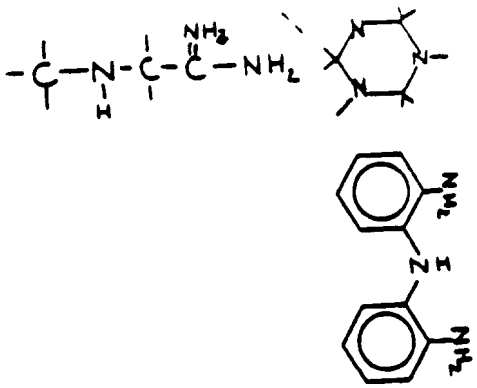
nols, phenol ethers, or inorganic phenolates or mixtures thereof with the aryl rings to which they are bonded, e.g.,



etc.

186 This subclass is indented under subclass 183. Subject matter wherein at least one reactant contains three or more amino-nitrogen atoms.

(1) Note. An amine proper for this subclass requires (a) at least three distinct nitrogen atoms bonded to at least two distinct carbon atoms, or (b) the presence of at least three nitrogen atoms bonded to the same carbon atom. Each nitrogen atom single or double bonded in the manner set forth above and consistent with the (1) Note above is an amine. The following are examples of triamines:



187 This subclass is indented under subclass 186. Subject matter wherein a reactant contains three or more carboxylic acid groups or three or more carboxylic acid derivatives or any combination thereof.

188 This subclass is indented under subclass 183. Subject matter wherein a reactant contains three or more carboxylic acid groups, three or more carboxylic acid derivatives, or contains a combination thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:

184, for an amino-nitrogen containing carboxylic acid or amino-containing derivative of a carboxylic acid.

189 This subclass is indented under subclass 188. Subject matter wherein two or more reactants, each containing two or more carboxylic acid groups, or two or more derivatives of acids, each containing two or more carboxylic acid groups or a combination thereof, are utilized.

190 This subclass is indented under subclass 176. Subject matter wherein at least one reactant contains a fused or bridged ring structure with the proviso that a cyclic anhydride is not the only ring fused or bridged to another ring.

(1) Note. A bridged or fused ring system for purposes of this subclass requires that a given ring system be attached at two different nuclear atoms of its ring to an atom or chain of atoms which, when taken together with the two nuclear atoms, forms an additional ring structure.

SEE OR SEARCH THIS CLASS, SUBCLASS:

176, for the reaction of a phenolic reactant with a reactant containing a carboxylic anhydride group.

191 This subclass is indented under subclass 176. Subject matter wherein a reactant contains a halogen atom with the proviso that the halogen atom is other than as a halogen atom bonded directly to a carbonyl group,i.e., halo.

192 This subclass is indented under subclass 176. Subject matter wherein at least one reactant contains an ethylenically unsaturated group.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "ethylenically unsaturated".

193 This subclass is indented under subclass 176. Subject matter wherein a polymer is derived from at least two or more phenols, phenol ethers, or inorganic phenolates or mixtures of two or more phenolic reactants.

194 This subclass is indented under subclass 176. Subject matter wherein a polymer is derived from two or more polycarboxylic acids or polycarboxylic acid derivatives.

SEE OR SEARCH THIS CLASS, SUBCLASS:
183+, for a polymer derived from an amino-containing polycarboxylic acid or amino-containing derivative of a polycarboxylic acid, or for a polymer derived from a non(amino nitrogen)-containing polycarboxylic acid or non(amino nitrogen)-derivative and an amino-containing reactant.

195 This subclass is indented under subclass 176. Subject matter wherein at least one nonphenolic reactant contains at least two hydroxyl groups or salts thereof.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see "alcohol" in the Glossary for a definition of the term "hydroxyl group".

196 This subclass is indented under subclass 86. Subject matter wherein a polymer is derived from a phenol, phenol ether, or inorganic phenolate and at least one reactant containing a halo halo, halo, or group.

(1) Note. Within the purview of this area is the interreaction of a phenolic compound containing a halo or group with a different phenolic reactant.

198 This subclass is indented under subclass 196. Subject matter wherein a phenol, phenol ether, or inorganic phenolate is reacted with a reactant containing a halo halo, halo, or group in the presence of a specified material.

(1) Note.

(A)For purposes of this subclass non-reactant materials (specified materials) which are present during a polymerization reaction and wherein the only metal atoms therein are Group IA (Li, Na, K, Rb, Cs, Fr) or Group IIA (Be, Mg, Ca, Sr, Ba, Ra) metal atoms or a mixture thereof, are not considered as being specified materials.

(B)Compounds which contain at least one Group IA or Group IIA and at least one other non-Group IA or non-Group IIA metal atom are proper herein and are classified on the basis of the non-Group IA or non-Group IIA metal atom.

(C)A mixture of a metal compound specifically excluded herefrom and another material which can be considered as being a specified material, per se, is classified herein on the basis of the specified material, per se.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for an explanation of the term "specified material".

199 This subclass is indented under subclass 198. Subject matter wherein the specified material is a nitrogen-containing compound.

200 This subclass is indented under subclass 198. Subject matter wherein the specified material contains at least one metal atom.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for the definition of "metals".

201 This subclass is indented under subclass 196. Subject matter wherein at least one reactant contains a fused or bridged ring with the proviso that a cyclic anhydride group is not the sole group fused or bridged to another ring.

(1) Note. A bridged or fused ring system of this subclass requires that a given ring system be attached at two different nuclear atoms of its ring to an atom or group of atoms which, when taken together with the two nuclear atoms, forms an additional ring system.

202 This subclass is indented under subclass 196. Subject matter wherein a reactant contains a halogen atom with the proviso that the halogen atom is other than as a halogen atom bonded directly to a carbonyl group i.e., halo.

203 This subclass is indented under subclass 196. Subject matter wherein at least one reactant contains a nitrogen atom.

204 This subclass is indented under subclass 196. Subject matter wherein a polymer is derived from at least two or more phenols, phenol ethers, or inorganic phenolates, or mixtures of two or more phenolic reactants.

205 This subclass is indented under subclass 86. Subject matter wherein an ethylenically unsaturated phenol, phenol ether, or inorganic phenolate is a reactant, or wherein a phenol, phenol ether, or inorganic phenolate is reacted with an ethylenically unsaturated reactant.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for the definition of the term “ethylenically unsaturated”.

206 This subclass is indented under subclass 86. Subject matter wherein a phenol, phenol ether, or inorganic phenolate containing at least one carboxylic acid group, or a carboxylic acid derivative thereof is a reactant.

SEE OR SEARCH THIS CLASS, SUBCLASS:
170, for a polymer derived from an imide-containing phenol, phenol ether, or inorganic phenolate.
176, for a polymer derived from a phenolic reactant and at least one reactant which is a polycarboxylic acid or a polycarboxylic acid derivative, and for a definition of what is considered as being a polycarboxylic acid derivative.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “carboxylic acid”.

207 This subclass is indented under subclass 206. Subject matter wherein a phenol, phenol ether, or inorganic phenolic reactant containing at least one carboxylic acid group, or carboxylic acid derivative group is reacted in the presence of a specified material.

(1) Note.

(A)For purposes of this subclass nonreactant materials (specified materials) which are present during a polymerization reaction and wherein the only metal atoms therein are Group IA (Li, Na, K, Rb, Cs, Fr) or Group IIA(Be, Mg, Ca, Sr, Ba, Ra) metal atoms or a mixture thereof, are not considered as being specified materials.

(B)Compounds which contain at least one Group IA or Group IIA and at least one other non-Group IA or non-Group IIA metal atom are proper herein and are classified on the basis of the non-Group IA or non-Group IIA metal atom.

(C)A mixture of a metal compound specifically excluded herefrom and another material which can be considered as being a specified material, per se, is classified herein on the basis of the specified material, per se.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for an explanation of the term “specified material”.

208 This subclass is indented under subclass 206. Subject matter wherein the reactant is a nitrogen-containing material.

209 This subclass is indented under subclass 206. Subject matter wherein at least one nonphenolic reactant contains at least two hydroxyl groups or salts thereof.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see "alcohol" in the Glossary for a definition of the term "hydroxyl group".

210 This subclass is indented under subclass 86. Subject matter wherein a reactant is a phenol, phenol ether, or inorganic phenolate containing at least one nitrogen atom.

SEE OR SEARCH THIS CLASS, SUBCLASS:

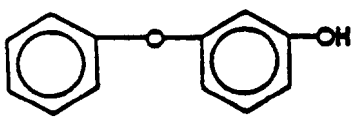
99, for a polymer derived from a phenolic nitrogen-containing 1, 2-epoxy reactant or from a phenolic nitrogen containing material and a 1, 2-epoxy reactant.

183, for a polymer derived from at least a polycarboxylic acid or derivative and at least one phenolic reactant wherein the phenolic reactant may contain a nitrogen atom.

211 This subclass is indented under subclass 86. Subject matter wherein a polymer is derived from a phenol ether or inorganic phenolate and a nitrogen-containing reactant.

212 This subclass is indented under subclass 86. Subject matter wherein a phenol, phenol ether, or inorganic phenolate reactant contains only one phenolic hydroxyl or one inorganic phenolate group.

(1) Note. A compound having a single phenolic hydroxyl or inorganic phenolate group may, for purposes of this subclass, contain one or more phenolic ether groups, e.g.,



, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

219, for a sole phenolic reactant having two or more phenolic hydroxyl or inorganic phenolate groups.

214 This subclass is indented under subclass 212. Subject matter wherein the phenolic reactant is polymerized in the presence of a specified material.

(1) Note.

(A)For purposes of this subclass nonreactant materials (specified materials) which are present during a polymerization reaction and wherein the only metal atoms therein are Group IA (Li, Na, K, Rb, Cs, Fr) or Group IIA (Be, Mg, Ca, Sr, Ba, Ra) metal atoms or a mixture thereof, are not considered as being specified materials.

(B)Compounds which contain at least one group IA or Group IIA and at least one other non-Group IA or non-Group IIA metal atom are proper herein and are classified on the basis of the non-group IA or the non-Group IIA metal atom.

(C)A mixture of a metal compound specifically excluded herefrom and another material which can be considered as being a specified material, per se, is classified herein on the basis of the specified material, per se.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for an explanation of the term "specified material".

215 This subclass is indented under subclass 214. Subject matter wherein the specified material is a nitrogen-containing compound.

216 This subclass is indented under subclass 215. Subject matter wherein the specified nitrogen-containing material contains at least one nitrogen atom as a ring member of a heterocyclic compound.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "heterocyclic".

217 This subclass is indented under subclass 214. Subject matter wherein the specified material contains at least one metal atom.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for the definition of "metals".

218 This subclass is indented under subclass 212. Subject matter wherein a polymer is derived from (1) at least two phenolic reactants each of which contains only a single phenolic hydroxyl group, or a mixture of inorganic phenolates thereof, or a mixture of a phenolic reactant containing a single hydroxyl group and another phenolic reactant which is an inorganic phenolate of a phenolic reactant containing only a single hydroxyl group, or (2) wherein a phenolic reactant containing a single phenolic hydroxyl group or a phenolate thereof is reacted with a compound containing an ether oxygen atom bonded to two discrete aryl rings.

219 This subclass is indented under subclass 86. Subject matter wherein a phenol, phenol ether, or inorganic phenolate contains two or more phenolic hydroxyl groups, or is an inorganic phenolate thereof, or contains at least one phenolic hydroxyl group and at least one inorganic phenolate group.

220 This subclass is indented under subclass 1. Subject matter under Class 520, ... involving polymers derived from a ketone reactant or processes of polymerizing; polymerizable compositions containing as a reactant a ketone or process of preparing .

(1) Note. For purposes of this subclass a reactant having a ketene (C=C=O) group is considered as being a ketone.

SEE OR SEARCH THIS CLASS, SUBCLASS:
480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also provide for processes of admixing with a broadly claimed nonreactant material.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "ketone".
526, Synthetic Resins or Natural Rubbers, subclass 316 for a polymer derived from an ethylenically unsaturated ketone as sole monomer or for an interpolymer derived from only ethylenically unsaturated reactants wherein at least one of the reactants is an ethylenically unsaturated ketone.

222 This subclass is indented under subclass 220. Subject matter wherein a ketone reactant is polymerized in the presence of a specified material.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for an explanation of the term "specified material".

223 This subclass is indented under subclass 222. Subject matter wherein the specified material contains at least one atom of phosphorus or sulfur.

224 This subclass is indented under subclass 222. Subject matter wherein the specified material is a nitrogen-containing compound.

225 This subclass is indented under subclass 222. Subject matter wherein the specified material contains at least one atom of boron or at least one atom of a polyvalent metal atom.

(1) Note. Polyvalent metal is limited to elements of atomic numbers 4, 12, 13, 20-33, 38-51, 56-84, 88, and higher.

226 This subclass is indented under subclass 220. Subject matter wherein the material is a ketone which is reacted with at least one sulfur-containing reactant.

227 This subclass is indented under subclass 220. Subject matter wherein a ketone-containing material is reacted with at least one aldehyde or derivative.

SEE OR SEARCH THIS CLASS, SUBCLASS:

230, for a definition of an aldehyde or derivative.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of "aldehyde" or "aldehyde derivative".

228 This subclass is indented under subclass 220. Subject matter wherein a ketone is reacted with at least one nitrogen-containing reactant.

229 This subclass is indented under subclass 228. Subject matter wherein a nitrogen reactant contains at least on nitrogen atom as an amino-nitrogen.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for the definition of "amine".

230 This subclass is indented under subclass 1. Subject matter under Class 520, ... involving polymers derived from at least one aldehyde or derivative as a reactant or processes of polymerizing; polymerizable compositions containing as a reactant an aldehyde or derivative or process of preparing.

(1) Note.

(A)An aldehyde derivative for purposes of this subclass includes

(1) Compounds having a X-CH2OH group wherein X is other than carbon or hydrogen. Included herein are paraformaldehyde, methylol derivatives of urea, etc.

(2) Heterocyclic compounds having only carbon and oxygen as ring atoms in an alternating manner and in equal amount, as illustrated below. Included herein is trioxane.

(3) Hexamethylenetetramine or derivative, e.g., as illustrated below. A derivative of this type requires the basic ring structure of hexamethylenetetramine but wherein the hydrogen atoms may have been replaced by other atoms.

(2) Note. Compounds having a methylol group (-CH2OH) bonded to atoms other than carbon, oxygen, or hydrogen are regarded for this subclass as being two compounds, one of which is formaldehyde. For instance, a methylol derivative of melamine is regarded as being a mixture of melamine and formaldehyde. Methylol urea is regarded as being a mixture of formaldehyde and urea.

(3) Note. Solid paraformaldehyde polymers will be regarded as reactants.

SEE OR SEARCH THIS CLASS, SUBCLASS:

403, for heterocyclic oxygen-containing reactants such as dioxolane, dioxepan, etc.

480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also provide for processes of admixing with a broadly claimed nonreactant material.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition "aldehyde".

523, Synthetic Resins or Natural Rubbers, subclass 1 for the distinction between that class and this area, and see in particular, section D in the class definition.

526, Synthetic Resins or Natural Rubbers, subclass 315 for a polymer derived from an ethylenically unsaturated aldehyde as sole reactant or for an interpolymer derived from only ethylenically unsaturated reactants wherein at least one of the ethylenically unsaturated reactants contains an aldehyde group.

232 This subclass is indented under subclass 230. Subject matter wherein an aldehyde or derivative is polymerized in the presence of a special material.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for the definition of the term "specified material".

233 This subclass is indented under subclass 232. Subject matter wherein the specified material contains at least one metal atom.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for the definition of "metals".

234 This subclass is indented under subclass 233. Subject matter wherein the specified material contains at least one transition metal atom.

(1) Note. Transition metal is limited to elements of atomic numbers 21-29, 39-47, 57-79, 89, and higher.

235 This subclass is indented under subclass 234. Subject matter wherein the transition metal is a Group VIII metal atom, i.e., Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt.

236 This subclass is indented under subclass 233. Subject matter wherein the specified material contains at least one heavy metal atom.

(1) Note. Since transition metals are not classified herein subclasses 234+ above, the term "heavy metal" herein is limited to elements of atomic numbers 30-33, 48-51, 80-84, and 88.

SEE OR SEARCH THIS CLASS, SUBCLASS:

234+, for transition metal containing specified materials.

237 This subclass is indented under subclass 236. Subject matter wherein the specified material is a Group IVA metal atom, i.e., Ge, Sn, Pb.

238 This subclass is indented under subclass 233. Subject matter wherein the specified material contains at least one atom of aluminum.

239 This subclass is indented under subclass 233. Subject matter wherein the specified material contains at least one atom of a Group IA metal (i.e., Li, Na, K, Rb, Cs, Fr).

240 This subclass is indented under subclass 232. Subject matter wherein the specified material contains at least one atom of boron.

241 This subclass is indented under subclass 240. Subject matter wherein the specified material contains one boron atom which is bonded to three halogen atoms or is an organic complex wherein at least one boron atom therein is bonded to three halogen atoms.

242 This subclass is indented under subclass 232. Subject matter wherein the specified material contains at least one atom of phosphorus or sulfur.

243 This subclass is indented under subclass 232. Subject matter wherein the specified material is a nitrogen-containing compound.

244 This subclass is indented under subclass 230. Subject matter wherein at least one reactant contains a fluorine or phosphorus atom.

(1) Note. The fluorine or phosphorus atom may be part of the aldehyde or derivative or may be a material which is reacted with the aldehyde or derivative.

245 This subclass is indented under subclass 230. Subject matter wherein at least one aldehyde is glyoxal or a compound containing two or more aldehyde groups.

245.3 With a polycarboxylic acid reactant which is a dimer or trimer of an ethylenically unsaturated aliphatic monocarboxylic acid having at least ten carbon atoms; or adduct of said unsaturated monocarboxylic acid with an alpha, beta ethylenically unsaturated carboxylic acid or derivative:

This subclass is indented under subclass 230. Subject matter wherein a polycarboxylic acid reactant which is a dimer or trimer of ethylenically unsaturated aliphatic monocarbozylic acid having at least ten carbon atoms, or an adduct of said unsaturated monocarboxylic acid with an alpha, beta ethylenically unsaturated acid carboxylic acid or derivatives is present in addition to said aldehyde or derivative.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of "dimer or trimer of aliphatic monocarboxylic acid".

245.5 With a reactrant which is a fatty acid glycerol ester, a fatty acid or salt derived from a naturally occurring glyceride, tall oil, or a fatty acid derived from tall oil:

This subclass is indented under subclass 230. Subject matter wherein a reactant which is a fatty acid glycerol ester, a fatty acid or salt derived from a naturally occurring glyceride, tall oil, or fatty acid derived from tall oil is present in addition to said aldehyde or derivative.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see definition of "fatty acid" in the Glossary for a discussion of terms used herein.

246 This subclass is indented under subclass 230. Subject matter wherein at least one reactant contains an ethylenically unsaturated group with the proviso that a heterocyclic compound containing only oxygen and carbon atoms as ring members must possess at least one ethylenically unsaturated moiety exterior to the ring.

(1) Note. Excluded herein is furfural, furfuryl alcohol, etc.

(2) Note. A methylene group which is bonded to a heterocyclic carbon is considered as being exterior to the heterocyclic ring.

(3) Note. The unsaturation required for this subclass may be in the aldehyde or derivative thereof, or may be in a material which is reacted with an aldehyde or derivative.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for the definition of the term "ethylenically unsaturated".

247 This subclass is indented under subclass 230. Subject matter wherein the aldehyde or derivative is reacted with a hydrocarbon or halogenated hydrocarbon.

(1) Note. Halogenated hydrocarbon for purposes of this subclass also includes those compounds wherein all of the hydrogen atoms have been substituted by halogen atoms.

248 This subclass is indented under subclass 230. Subject matter wherein an aldehyde or derivative is reacted with at least one heterocyclic reactant, which reactant is a nonaldehyde or nonaldehyde derivative.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "heterocyclic".

249 This subclass is indented under subclass 248. Subject matter wherein the heterocyclic reactant which is not an aldehyde or derivative of an aldehyde contains at least one oxygen atom as a ring member of a heterocyclic ring.

250 This subclass is indented under subclass 249. Subject matter wherein the heterocyclic oxygen atom is part of a three-membered ring containing one oxygen atom and two carbon atoms (i.e., 1, 2-epoxy compound).

251 This subclass is indented under subclass 248. Subject matter wherein the heterocyclic reactant which is not an aldehyde or a derivative of

an aldehyde contains at least one sulfur atom as a ring member of a heterocyclic ring.

SEE OR SEARCH THIS CLASS, SUBCLASS:

255, for a polymer derived from a sulfur-containing triazine reactant and an aldehyde or aldehyde derivative.

252 This subclass is indented under subclass 248. Subject matter wherein the reactant which is not an aldehyde or derivative contains only two nitrogen atoms as ring members of a heterocyclic ring.

253 This subclass is indented under subclass 248. Subject matter wherein the reactant which is not an aldehyde or derivative contains two or more heterocyclic rings.

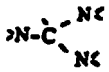
(1) Note. Included herein are those reactant compounds having two distinct heterocyclic ring moieties as well as those reactant compounds wherein a heterocyclic atom is shared between two ring moieties (i.e., fused or bridged rings).

254 This subclass is indented under subclass 248. Subject matter wherein the reactant which is not an aldehyde or derivative contains a six-membered ring having three nitrogen atoms and three carbon atoms as ring members.

255 This subclass is indented under subclass 254. Subject matter wherein the heterocyclic reactant having three nitrogen atoms and three carbon atoms as ring members contains at least one atom of sulfur.

256 This subclass is indented under subclass 254. Subject matter wherein a reactant containing a or group is utilized in preparing a polymer and wherein the or reactant is not an aldehyde or aldehyde derivative, or a compound having a six-membered heterocyclic ring containing three nitrogen and three carbon atoms as ring members.

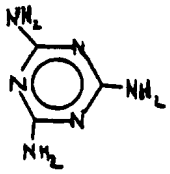
257 This subclass is indented under subclass 254. Subject matter wherein a reactant containing an extracyclic carbon atom bonded to at least three nitrogen atoms is utilized in preparing a polymer and wherein the reactant, as illustrated below, is not (1) an aldehyde or aldehyde derivative, or (2) a compound having a six-membered heterocyclic ring containing three nitrogen and three carbon atoms as ring members.



(1) Note. Extracyclic carbon as used in this subclass denotes a carbon atom which is not a ring atom of a ring-containing compound.

258 This subclass is indented under subclass 254. Subject matter wherein the heterocyclic reactant containing three nitrogen atoms and three carbon atoms is other than melamine, per se, or a methylol ($-CH_2OH$) derivative thereof.

(1) Note. The materials herein excluded are melamine, i.e., as illustrated below, or its derivatives wherein one or more of the available hydrogen atoms of melamine have been substituted by $-CH_2OH$ groups.



259 This subclass is indented under subclass 230. Subject matter wherein an aldehyde or its derivatives is reacted with at least one reactant which contains a group and wherein X is a chalcogen atom (O, S, Se, or Te).

260 This subclass is indented under subclass 259. Subject matter wherein two or more reactants containing groups are utilized, and wherein X is O, S, Se, or Te.

261 This subclass is indented under subclass 259. Subject matter wherein at least one reactant is a nonaldehyde or derivative or non group- (X is O, S, Se, or Te) containing material.

262 This subclass is indented under subclass 261. Subject matter wherein the nonaldehyde or derivative or non -containing reactant NX is O, S, Se, or Te) is a nitrogen-containing material.

263 This subclass is indented under subclass 262. Subject matter wherein the non- reactant (X is O, S, Se, or Te or nonaldehyde or derivative reactant is an organic compound containing two or more amino groups.

(1) Note. An amine proper for this subclass requires (a) at least two distinct nitrogen atoms bonded to at least two distinct carbon atoms, or (b) the presence of at least two nitrogen atoms bonded to the same carbon atom. Each nitrogen atom, single or double bonded, set forth above and consistent with the definitiom referred to in the Search Note below is the nitrogen of an amine.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “amine”.

264 This subclass is indented under subclass 259. Subject matter wherein X the - containing reactant is other than urea or thiourea, per se.

(1) Note. The materials excluded herein are urea, per se, i.e.,, or thiourea, per se, i.e.,

265 This subclass is indented under subclass 230. Subject matter wherein a sulfur-containing aldehyde or aldehyde derivative is utilized as a reactant, or wherein an aldehyde or aldehyde derivative is reacted with a sulfur-containing material.

266 This subclass is indented under subclass 230. Subject matter wherein an aldehyde or aldehyde derivative is reacted with at least one nitrogen-containing reactant and which nitrogen-containing reactant is not an aldehyde or aledhyde derivative.

267 This subclass is indented under subclass 266. Subject matter wherein the nitrogen-containing reactant which is not an aldehyde or aldehyde derivative is a nitrile group-containing material.

(1) Note. A nitrile for purposes of this subclass requires:

(A)The structure wherein n is an integer and wherein the C atom is not double bonded to oxygen, selenium, or tellurium.

(B)The structure wherein n is an integer.

(C)The structure wherein n is an integer and X is , or a derivative, i.e., salt, ester, amide, imide, lactam, lactone, anhydride, or nitrile.

268 This subclass is indented under subclass 266. Subject matter wherein the nitrogen-containing reactant which is not an aldehyde or aldehyde derivative contains at least one carbon atom bonded to at least three nitrogen atoms.

269 This subclass is indented under subclass 266. Subject matter wherein the nitrogen-containing reactant which is not an aldehyde or aldehyde derivative contains only a single amino-nitrogen atom.

SEE OR SEARCH THIS CLASS, SUBCLASS:
266, for a polyamine reactant.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “amine”.

270 This subclass is indented under subclass 230. Subject matter wherein a polymer is derived solely from reactants which are aldehydes or aldehyde derivatives or mixtures thereof.

271 This subclass is indented under subclass 1. Subject matter under Class 520, ... involving polymers derived from at least one carboxylic acid or carboxylic acid derivative or processes of polymerizing; polymerizable composition containing as a reactant a carboxylic acid or derivative or process of preparing.

(1) Note. A derivative of a carboxylic acid is limited to a nitrile, ester, anhydride,

salt, amide, imide, lactam, lactone, and acyl halide.

(2) Note. A carboxylic acid denotes:

(A1) The structure wherein n is one or greater and the C- atom is not double bonded to oxygen, sulfur, selenium, or tellurium, or is not triple bonded to nitrogen.

(A2) The structure wherein n is one or greater, e.g., formic acid when n=1.

(A3) The structure wherein n is an integer, e.g., oxalic acid when n=1.

(B1) The structure wherein n is one or more and the carbon atom bonded to the- group and the carbon atom single bonded to the oxygen atom of the group is not double bonded to oxygen, sulfur, selenium, or tellurium, or triple bonded to nitrogen.

(B2) The structure wherein the atom single bonded to the group is not double bonded to oxygen, sulfur, selenium, or tellurium, or is not triple bonded to nitrogen.

(B3) The structure wherein n is an integer and X is or a derivative as defined in the (1) Note of this subclass.

A carboxylic acid amide denotes:

(C1) The structure wherein n is one or greater and the atom bonded to the group is not double bonded to oxygen, sulfur, selenium, or tellurium, or triple bonded to nitrogen.

(C2) The structure wherein n is one or greater.

(C3) The structure wherein n is an integer and X isor a derivative as defined in the (1) Note of this subclass.

A nitrile for purposes of this subclass denotes:

(D1) The structure wherein n is an integer and wherein the atom is not double bonded to oxygen, sulfur, selenium, or tellurium.

(D2) The structure wherein n is an integer.

(D3) The structure wherein n is an integer and x is or a derivative, i.e., salt, ester, amide, imide, lactam, lactone, anhydride, or nitrile.

A carboxylic acid anhydride denotes:

(E1) The structure wherein n is one or more and wherein the carbon atom bonded to the group is not double bonded to oxygen, sulfur, selenium, or tellurium.

(E2) The structure wherein n is an integer, X is or a carboxylic acid derivcative as defined in the (1) Note of this subclass.

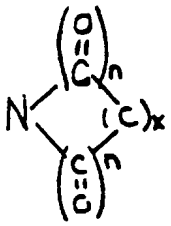
(E3) The structure In E1, E2, and E3 the group may be joined together in a ring. An acyl halide of a carboxylic acid denotes:

(F1) The structure wherein n is one or more and wherein the carbon atom bonded to group is not double bonded to oxygen, sulfur, selenium, or tellurium.

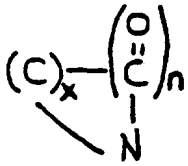
(F2) The structure halo wherein n is one or more.

(F3) The structure halo wherein n is an integer and X is or a carboxylic acid derivative as defined in the (1) Note of this subclass.

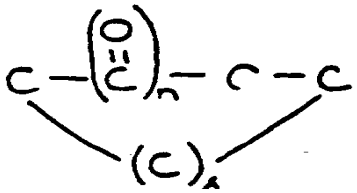
(G)A carboxylic acid imide denotes the structure wherein n and x are one or more, as illustrated below.



(H)The lactam of a carboxylic acid denotes the structure wherein n and x are one or more as illustrated below.



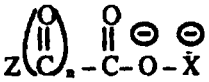
(I)The lactone of a carboxylic acid denotes the structure, illustrated below, wherein x and n are one or more and the carbon atom bonded to the group and the carbon atom single bonded to the oxygen atom of the group are not double bonded to oxygen, sulfur, selenium, or tellurium, or triple bonded to nitrogen.



(J1) The salt of a carboxylic acid denotes the structure, illustrated below, wherein n is one or more and the group and the X component are held together primarily by ionic forces: the carbon atom bonded to thegroup is not double bonded to oxygen, sulfur, or tellurium, or triple bonded to nitrogen.

(J2) The structure, illustrated below, wherein n is one or more and the group and the X component are held together primarily by ionic forces.

(J3) The structure, illustrated below, wherein n is an integer. Z is or a derivative as defined in the (1) Note of this subclass and wherein the X component and the component are held together primarily by ionic forces.

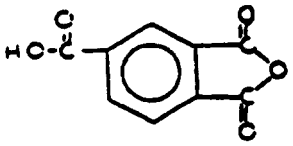


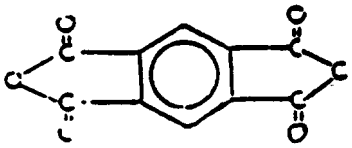
(3) Note. In the above definitions of carboxylic acid and their derivatives, certain compounds may have more than one function (e.g., a lactone is a species of ester, a lactam is a species of an amide). Compounds which are multifunctional are classified on the basis of the first-appearing function provided in the subclass hierarchy.

(4) Note. A polycarboxylic acid reactant for purposes of this subclass requires the presence of at least two carboxylic acid groups. A polycarboxylic acid derivative requires at least one carboxylic acid group and at least one carboxylic acid derivative, or at least two identical carboxylic acid derivatives, or at least two different carboxylic acid derivatives. See (1) Note above for an explanation of the term “derivative”.

(5) Note. For purposes of this subclass an anhydride having the general formula, which may be linear or cyclic is considered as being a polycarboxylic acid. A compound having both an anhydride and a free carboxylic acid is considered as

being a tricarboxylic acid, e.g. as in the first illustration below, and a compound containing two anhydride groups is considered as being a tetracarboxylic acid, e.g., as in the second illustration, below.





(6) Note. An imide is considered as being a dicarboxylic acid derivative.

(7) Note. An organic amine salt of a carboxylic acid has been classified as if it were a mixture of an amine and a carboxylic acid. An organic diamine salt of a dicarboxylic acid where the amine salt-forming groups are identical is considered as being a single amine compound; whereas if the amine groups are different then they are regarded as two amine compounds. Where the compound contains two or more nitrogen atoms bonded to the same or different noncarbonyl carbon atom then they are to be regarded as polyamines.

SEE OR SEARCH THIS CLASS, SUBCLASS:

170, for the reaction of an imide-containing phenolic reactant or for the reaction of a phenolic reactant with an imide-containing reactant.

263, see (2) Note for an explanation of the term “polyamine”.

480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also provide for processes of admixing with a broadly claimed nonreactant material.

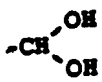
SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, for a definition of the term “amine”.

272 This subclass is indented under subclass 271. Subject matter involving a polymer derived (1) from one or more di- or higher esters of a polycarboxylic acid as the sole reactant or reactants, or (2) from at least a polycarboxylic acid or derivative thereof and at least a compound containing two or more hydroxyl groups or salts thereof.

(1) Note. A hydroxyl group denotes the bonding of an -OH group to a carbon atom and wherein the carbon atom is not double bonded to oxygen, sulfur, selenium, or tellurium, or triple bonded to nitrogen.

(2) Note. A compound containing two or more hydroxyl groups or salts thereof requires (a) at least two distinct -OH or salt groups bonded to different carbon atoms, e.g., HO-CH2-CH2-OH, etc., or (b) two or more -OH or salt groups bonded to the same carbon atom, e.g.,



etc.

(3) Note. A compound which contains a single C-OH group and a single C-O salt group is proper for this subclass.

(4) Note. A claim which recites the aftertreatment of a solid polymer wherein no preparation of said polymer is claimed is not proper for this subclass. See Search Notes, infra.

SEE OR SEARCH THIS CLASS, SUBCLASS:

481, for (a) the process of heating particles of polyethlene terephthalate at 250°C in an affluent gaseous stream of nitrogen to increase the polymer's molecular weight. and (2) the process of

condensing a polyester precondensate havinga relative viscosity of 1.05-1.15 at 220°C-280°X υνδερ ρεδυχεδ πρεσσυρε.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, II, B, 2 in the class definition for a definition of what constitutes a solid polymer. Also, terms such as relative viscosity, intrinsic viscosity and polymer melt also connote a solid polymer.
525, Synthetic Resins or Natural Rubbers, subclass 437, for heating of solid polyethylene terephthalate in the presence of P_2O_5 dehydrating agent.

274 This subclass is indented under subclass 272. Subject matter wherein (1) one or more di- or higher esters of a carboxylic as sole reactant, or (2) a polycarboxylic acid or derivative thereof and a reactant containing two or more hydroxyl groups or salts thereof are polymerized in the presence of a specified material.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for an explanation of the term “specified material”.

275 This subclass is indented under subclass 274. Subject matter wherein the specified material contains at least one metal atom.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for the definition of “metals”.

276 This subclass is indented under subclass 275. Subject matter wherein the metal atom is in the elemental state.

(1) Note. An alloy is considered as being a mixture of elemental metals and is proper for this subclass.

277 This subclass is indented under subclass 275. Subject matter wherein the specified material contains at least one atom of a transition metal.

(1) Note. Transition metal atom is limited to elements of atomic numbers 21-29, 39-47, 57-79, 89, and higher.

278 This subclass is indented under subclass 277. Subject matter wherein the specified material contains at least one transition metal of atomic numbers 57-71 or 89 and higher.

279 This subclass is indented under subclass 277. Subject matter wherein the specified material contains at least one Group IVB transition metal atom (i.e., Ti, Zn, Hf).

280 This subclass is indented under subclass 277. Subject matter wherein the specified material contains at least one Group VIII metal atomi (i.e., Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt).

281 This subclass is indented under subclass 275. Subject matter wherein the specified material contains a Group IIB metal atom (i.e., Zn, Cd, Hg).

282 This subclass is indented under subclass 275. Subject matter wherein the specified material contains a Group IIIA metal atom (i.e., Al, Ga, In, Tl).

283 This subclass is indented under subclass 275. Subject matter wherein the specified material contains a Group IVA metal atom, i.e., Ge, Sn, Pb.

284 This subclass is indented under subclass 283. Subject matter wherein the specified material contains at least one atom of lead.

285 This subclass is indented under subclass 275. Subject matter wherein the specified material contains a Group VA metal atom (i.e., As, Sb, Bi).

286 This subclass is indented under subclass 274. Subject matter wherein the specified material contains at least one phosphorus atom.

287 This subclass is indented under subclass 272. Subject matter wherein at least one reactant contains a phosphorus atom.

(1) Note. The phosphorus atom may be in a polycarboxylic acid or in a derivative

thereof, or it may be in a polyhydroxyl compound or in a salt thereof, or it may be in an additional reactant.

288 This subclass is indented under subclass 272. Subject matter wherein at least one reactant contains a nitrogen atom.

(1) Note. The nitrogen atom may be in a carboxylic acid or derivative thereof, or it may be in a polyhydroxyl compound or salt thereof, or it may be in an additional reactant.

289 This subclass is indented under subclass 288. Subject matter wherein a final polymeric product contains a heterocyclic ring having a nitrogen atom as a ring member.

(1) Note. The final product may be formed from a heterocyclic reactant having a nitrogen atom as a ring member or may be formed from a nonheterocyclic nitrogen-containing compound. The sole requirement for placement in this subclass is that the final product contain a nitrogen atom as a ring member of a heterocyclic ring.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “heterocyclic”.

290 This subclass is indented under subclass 288. Subject matter wherein a reactant contains at least one sulfur atom.

(1) Note. The sulfur and nitrogen atoms required for this subclass may be in the same reactant or may be in different reactants.

291 This subclass is indented under subclass 288. Subject matter wherein a nitrogen atom is part of a compound containing two or more hydroxyl groups or is a salt thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:
288+, for a salt of a non-nitrogen-containing polyhydroxyl compound wherein nitrogen is solely present in the cation moiety.

292 This subclass is indented under subclass 288. Subject matter wherein a nitrogen atom is part of polycarboxylic acid, or is part of a derivative thereof, or is a nitrogen-containing derivative of a nonnitrogen-containing polycarboxylic acid.

293 This subclass is indented under subclass 272. Subject matter wherein at least one reactant contains a sulfur atom.

(1) Note. The sulfur atom may be in polycarboxylic acid or in a derivative thereof, or it may be in a polyhydroxyl compound or in a salt thereof, or it may be in an additional reactant.

294 This subclass is indented under subclass 293. Subject matter wherein a sulfur atom is part of a compound containing two or more hydroxyl groups or is a salt thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:
293+, for salt of a nonsulfur-containing polyhydroxyl compound wherein sulfur is solely present in the cation moiety.

295 This subclass is indented under subclass 293. Subject matter wherein at least one reactant contains at least one atom of sulfur and at least one aromatic ring.

295.3 Polycarboxylic acid reactant which is a dimer or trimer of an ethylenically unsaturated aliphatic monocarboxylic acid having at least ten carbon atoms; or adduct of said unsaturated monocarboxylic acid with an alpha, beta ethylenically unsaturated carboxylic acid or derivative:
This subclass is indented under subclass 272. Subject matter wherein there is at least one polycarboxylic reactant which is a dimer or trimer of ethylenically unsaturated aliphatic monocarboxylic acid having at least ten carbon atoms, or an adduct of said unsaturated monocarboxylic acid with an alpha, beta ethylenically carboxylic acid or derivative.

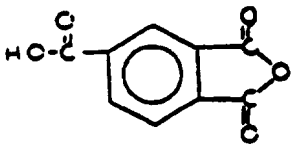
SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of "dimer or trimer of an aliphatic monocarboxylic acid".

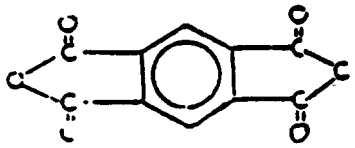
295.5 Reactant which is a fatty acid glycerol ester, fatty acid or salt derived from a naturally occurring glyceride, tall oil, or a fatty acid derived from tall oil:
This subclass is indented under subclass 272. Subject matter wherein there is at least one reactant which is a fatty acid glycerol ester; a fatty acid or salt derived from a naturally occurring glyceride, tall oil, or a fatty acid derived from tall oil.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the definition of "fatty acid" in the Glossary for a discussion of the terms used herein.

296 This subclass is indented under subclass 272. Subject matter wherein at least one reactant is present which contains three or more carboxylic acid groups, or wherein a reactant is present which contains three or more carboxylic acid derivative groups, or mixtures thereof (e.g., trimellitic acid, pyromellitic tetracarboxylic acid dianhydride, etc.).

(1) Note. For purposes of this subclass an anhydride having the general formula, which may be linear or cyclic is considered as being a polycarboxylic acid. A compound having both an anhydride and a free carboxylic acid is considered as being a tricarboxylic acid, e.g., as shown below in the first illustration, and a compound containing two anhydride groups is considered as being a tetracarboxylic acid, e.g., as shown below in the second illustration.





297 This subclass is indented under subclass 272. Subject matter wherein at least one reactant contains a heterocyclic ring solely composed of two carbon atoms and one oxygen atom as ring members.

(1) Note. The 1, 2-epoxy ring may be part of the carboxylic acid or derivative or may be part of an additional reactant.

298 This subclass is indented under subclass 272. Subject matter wherein at least one reactant contains a fused or bridged ring with the proviso that the cyclic anhydride group is not the sole group fused or bridged to another ring.

(1) Note. A bridged or fused ring system for purposes of this subclass requires that a given ring system be attached at two different nuclear atoms of its ring system to an atom or chain of atoms which, when taken together with the two nuclear atoms, forms an additional ring structure.

SEE OR SEARCH THIS CLASS, SUBCLASS:
308+, for phthalic acid anhydride as a reactant.

299 This subclass is indented under subclass 272. Subject matter wherein a reactant contains a halogen atom with the proviso that the halogen atom is other than as a halogen atom bonded directly to a carbonyl group (i.e., halo).

300 This subclass is indented under subclass 272. Subject matter wherein a reactant containing two or more hydroxyl groups or a salt thereof contains at least one ether oxygen atom.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "ether".

301 This subclass is indented under subclass 300. Subject matter wherein the ether reactant is devoid of any cycloaliphatic, aromatic, or heterocyclic ring.

302 This subclass is indented under subclass 272. Subject matter wherein a reactant mixture contains two or more carboxylic acids, or at least two carboxylic acid derivatives, or a mixture of at least one carboxylic acid and a carboxylic acid derivative.

303 This subclass is indented under subclass 302. Subject matter wherein at least one carboxylic acid reactant contains ethylenic unsaturation, or wherein at least a derivative of a carboxylic acid contains ethylenic unsaturation.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "ethylenically unsaturated".

304 This subclass is indented under subclass 303. Subject matter wherein (1) at least one reactant is an ethylenically unsaturated aromatic carboxylic acid or is a derivative thereof, or (2) the mixture contains as a reactant at least one ethylenically unsaturated carboxylic acid or derivative thereof, and at least one aryl-containing carboxylic acid or derivative thereof.

305 This subclass is indented under subclass 302. Subject matter wherein each of the carboxylic acids or derivatives contains at least one aryl group.

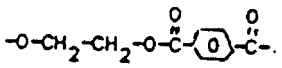
306 This subclass is indented under subclass 272. Subject matter wherein a reactant is an ethylenically unsaturated carboxylic acid or a derivative of an ethylenically unsaturated carboxylic acid (e.g., maleic anhydride, etc.).

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "ethylenically unsaturated".

307 This subclass is indented under subclass 272. Subject matter wherein at least one reactant contains a ring solely composed of carbon atoms and is nonaromatic.

308 This subclass is indented under subclass 272. Subject matter wherein at least one reactant is an aryl-containing dicarboxylic acid or a derivative of an aryl-containing dicarboxylic acid.

308.1 Polyethylene terephthalate, per se:
This subclass is indented under subclass 308. Subject matter wherein the process involves either ethylene glycol and terephthalic acid, per se; ethylene glycol and dimethyyl terephthalate; or bis(hydroxyethyl)terephthalate as sole reactant(s) or the preparation of a solid polymer having the sole repeating units of the structure, below, "or products thereof."



(1) Note. A polymer described as polyethylene terephthalate is presumed to be derived from the starting monomers of this subclass or to have the structure above, unless the patent otherwise specifies.

SEE OR SEARCH THIS CLASS, SUBCLASS:
308.6+, for processes of preparing other polyesters derived from terephthalic acid or substituted forms thereof.

308.2 Physically after-treated solid polymer:
This subclass is indented under subclass 308.1. Subject matter wherein the polymer claimed has been treated by physical means, such as stretching, heating, cutting, spinning, etc., in order to change the physical properties of the polymer.

(1) Note. The specification may be read in conjunction with the claims to determine whether the polymer has been physically treated within the meaning of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:
480+, for processes of treating a polymer by chemical means in order to change physical, but not chemical properties

of the polymer and for processes of chemically modifying polymers solely by physical processes in the absence of a chemical treating agent.

SEE OR SEARCH CLASS:

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, appropriate subclasses, for processes for preparation of a polymer wherein a significant molding step, such as spinning into a specifically named bath, is recited and note especially subclasses 340+ for processes in which preformed, shaped or solid articles are subjected to treatment, including all procedures in which the chemical or physical properties or characteristics of a work piece are modified or controlled by other than mechanically shaping by contacting the work with a solid shaping member.

525, Synthetic Resins or Natural Rubbers, subclasses 50+, for processes of chemically modifying solid polymers in the presence of a chemical treating agent or reactant or products thereof.

308.3 Processes of preparing:

This subclass is indented under subclass 308.1. Subject matter wherein the process of polymerization involving the stated reactants is claimed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

308.1, for products of the such processes.

308.4 In presence of hydrocarbon, steam or water:

This subclass is indented under subclass 308.3. Subject matter wherein at least one step of the process utilizes either a compound derived solely from carbon and hydrogen, water or steam.

(1) Note. An aqueous acid or base solution is classified herein provided the acid or base is not specified; for example, claims drawn to “an aqueous base” would be classified herein.

SEE OR SEARCH THIS CLASS, SUBCLASS:

274, for claims drawn to inter alia an aqueous solution of a specified base; e.g., aqueous ammonia.

308.5 At least two claimed distinct temperature or pressure gradients:

This subclass is indented under subclass 308.3. Subject matter wherein the process involves at least two distinct gradients, either temperature and/or pressure.

(1) Note. A temperature range, such as 273°C - 283°C or “a temperature less than 300°C, “is considered to be one distinct gradient for this subclass. A temperature described as commencing at 273°C and gradually being increased to 283°C is considered to be “at least two distinct gradients” for purposes of this subclass.

308.6 Contains terephthalic acid or substituted forms thereof:

This subclass is indented under subclass 308. Subject matter wherein the process involves terephthalic acid or substituted forms thereof or products thereof.

308.7 Derived from at least two reactants simultaneously containing a C - OH group:

This subclass is indented under subclass 308.6. Subject matter wherein the process involves simultaneously at least two reactants having at least one C - OH group or products thereof.

(1) Note. The two alcohol reactants are not considered to react simultaneously for purposes of this subclass when one reactant has completely reacted with another material before the addition of the second alcohol reactant.

SEE OR SEARCH THIS CLASS, SUBCLASS:

308.6, or 308.8+, for processes involving two reactants containing an alcohol group wherein the two reactants are not involved simultaneously.

308.8 Processes of preparing:
This subclass is indented under subclass 308.6. Subject matter wherein a polymerization process involving the stated reactants is claimed.

SEE OR SEARCH THIS CLASS, SUBCLASS:
308.6, or 308.7, for products prepared by a process involving this subclass.

309.1 At least two claimed distinct temperature or pressure gradients:
This subclass is indented under subclass 308.8. Subject matter wherein the process involves at least two distinct gradients, either temperature and/or pressure.

(1) Note. A temperature range, such as 273°C - 283°C or a "temperature less than 300°C," is considered to be one distinct gradient for this subclass. A temperature described as commencing at 273°C and gradually being increased to 283°C is considered to be "at least two distinct gradients" for purposes of this subclass.

310 This subclass is indented under subclass 271. Subject matter involves a polymer derived from an imide, lactam, or from an amino-nitrogen-containing carboxylic acid or from a derivative of an amino-nitrogen-containing carboxylic acid.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "amine".

312 This subclass is indented under subclass 310. Subject matter wherein an imide, lactam, or an amino-nitrogen-containing carboxylic acid or a derivative thereof is polymerized in the presence of a specified material.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for the definition of the term "specified material".

313 This subclass is indented under subclass 312. Subject matter wherein the specified material contains a phosphorus or sulfur atom.

314 This subclass is indented under subclass 312. Subject matter wherein the specified material contains at least one nitrogen atom as a ring member of a heterocyclic ring with the proviso that the sole heterocyclic ring is not a lactam.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "heterocyclic".

315 This subclass is indented under subclass 312. Subject matter wherein the specified material contains at least one nitrogen-containing compound.

(1) Note. A lactam utilized as a specified material is excluded herefrom and is classified below as a specified material on some other basis. A compound, however, which contains a nitrogen atom in addition to the nitrogen atom of a lactam ring is proper for this subclass.

316 This subclass is indented under subclass 312. Subject matter wherein the specified material is a ketone or aldehyde.

(1) Note. The term "aldehyde" herein does not include aldehyde derivatives, such as acetals or hemiacetals.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the terms "ketone" and "aldehyde".

317 This subclass is indented under subclass 312. Subject matter wherein the specified material is an alcohol, ether, or inorganic alcoholate.

SEE OR SEARCH THIS CLASS, SUBCLASS:
319, for a polyvalent metal-containing specified material when a metal atom is not part of an inorganic alcholate.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the terms "alcohol" and "ether".

318 This subclass is indented under subclass 312. Subject matter wherein the specified material is a carboxylic acid, acyl halide thereof, ester thereof, or lactone thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:
271, for a definitions of the types of chemical compounds specified herein.

319 This subclass is indented under subclass 312. Subject matter wherein the specified material contains a polyvalent metal atom.

(1) Note. Polyvalent metal is limited to elements of atomic numbers 4, 12, 13, 20-33, 38-51, 56-84, 88, and higher.

320 This subclass is indented under subclass 312. Subject matter wherein the specified material contains an atom of silicon.

321 This subclass is indented under subclass 310. Subject matter wherein a reactant contains a phosphorus or sulfur atom.

(1) Note. The phosphorus or sulfur atom may be part of an imide, lactam, or amino-containing carboxylic acid or derivative, or may be part of a coreactant.

322 This subclass is indented under subclass 310. Subject matter wherein a reactant contains an imide group.

323 This subclass is indented under subclass 310. Subject matter wherein a reactant contains a lactam group.

324 This subclass is indented under subclass 323. Subject matter wherein a polymer has been derived from at least three reactants with the proviso that one reactant is a lactam-containing material, a second reactant is a carboxylic acid or derivative, and a third derivative is a compound containing two or more amino-nitrogen atoms.

(1) Note. This subclass provides for the reaction of two lactam reactants and a single polyamine reactant.

SEE OR SEARCH THIS CLASS, SUBCLASS:
263, (2) Note. for an explanation of the term “polyamine”.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “amine”.

325 This subclass is indented under subclass 323. Subject matter wherein a polymer has been derived from (1) at least two lactam-containing reactants, or (2) at least one lactam reactant and (a) at least one amino-containing carboxylic acid, or (b) at least a derivative of an amino-containing carboxylic acid.

326 This subclass is indented under subclass 323. Subject matter wherein a lactam reactant contains three to five carbon atoms in a lactam ring, or 12 or more carbon atoms in a lactam ring.

327 This subclass is indented under subclass 310. Subject matter wherein at least one reactant contains a heterocyclic ring atom, or wherein one reactant contains at least one nitrogen atom bonded directly to another nitrogen atom.

(1) Note. Included in this subclass are n-carboanhydrides.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “heterocyclic”.

328 This subclass is indented under subclass 310. Subject matter wherein the amino-carboxylic acid reactant contains a group (n is one or more) or is a carboxylic acid derivative thereof, and wherein the nitrogen atom bonded to the single carbon atom which is bonded to the group may be bonded to any other atom other than to a carbon atom which is double bonded to oxygen, sulfur, selenium, or tellurium or triple bonded to a nitrogen atom.

329.1 This subclass is indented under subclass 310. Subject matter wherein a polymer has been derived from at least three reactants with the proviso that (1) at least one reactant is an

amino-containing carboxylic acid or carboxylic acid derivative of an amino-containing carboxylic acid; (2) a second reactant is a carboxylic acid or derivative which is devoid of any amino groups, and (3) a third reactant is polyamine which is devoid of any carboxylic acid groups or carboxylic acid derivative groups.

SEE OR SEARCH THIS CLASS, SUBCLASS:
263, (2) Note, for an explanation of the term “polyamine”.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “amine”.

330 This subclass is indented under subclass 310. Subject matter wherein at least one reactant contains a saturated carbocyclic ring.

(1) Note. The term as utilized herein includes a fused or bridged ring system.

331 This subclass is indented under subclass 310. Subject matter wherein at least one reactant contains an aromatic ring.

332 This subclass is indented under subclass 271. Subject matter wherein a polymer is derived from at least one reactant which is an organic amine salt of a carboxylic acid, or wherein a carboxylic acid or carboxylic acid derivative is reacted with an organic amine.

(1) Note. An organic amine salt of a carboxylic acid has been classified as if it were a mixture of an amine and a carboxylic acid. An organic diamine salt of a dicarboxylic acid where the amine salt-forming groups are identical is considered as being a single amine compound; whereas if the amine groups are different then they are regarded as two amine compounds. Where the compound contains two or more nitrogen atoms bonded to the same or different noncarbonyl carbon atom then they are to be regarded as polyamines.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “amine'.

335 This subclass is indented under subclass 332. Subject matter wherein a polymer is derived from a dicarboxylic acid or from a dicarboxylic acid derivative thereof and an organic amine, or wherein a reactant is an organic amine salt of a dicarboxylic acid or derivative.

(1) Note. The reactant may be the monoamine salt of a dicarboxylic acid, the diamine salt thereof, or it may be the diamine or monoamine salt of a dicarboxylic acid derivative.

SEE OR SEARCH THIS CLASS, SUBCLASS:
350+, for polymers derived from a tri or higher carboxylic acid or derivative and a polyamine.

336 This subclass is indented under subclass 335. Subject matter wherein an organic amine salt of a dicarboxylic acid or derivative is polymerized, or wherein a dicarboxylic acid or derivative thereof and an organic amine are polymerized in the presence of a specified material.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “specified material”.

337 This subclass is indented under subclass 335. Subject matter wherein at least one reactant contains a phosphorus or sulfur atom.

338 This subclass is indented under subclass 335. Subject matter wherein a polymer is derived from at least four reactants, two of which are dicarboxylic acids or carboxylic acid derivatives and two of which are organic polyamines.

(1) Note. Two compounds which are organoamine salts of two different dicarboxylic acids, wherein each of the two amine salts are different and wherein each in its own right is a polyamine, would meet the requirements of this sub-

class. In addition, a carboxylic acid in admixture with a diamine salt of a different dicarboxylic acid, wherein each of the diamine salts are different and wherein each is a polyamine, would be properly classified herein.

339 This subclass is indented under subclass 335. Subject matter wherein a polymer is derived from at least two dicarboxylic acids or at least two dicarboxylic acid derivatives.

339.3 Polycarboxylic acid reactant which is a dimer or trimer of an ethylenically unsaturated aliphatic monocarboxylic acid having at least ten carbon atoms; or adduct of said unsaturated monocarboxylic acid with an alpha, beta ethylenically unsaturated carboxylic acid or derivative:
This subclass is indented under subclass 339. Subject matter wherein there is at least one reactant which is a dimer or trimer or ethylenically unsaturated aliphatic monocarboxylic acid having at least ten carbon atoms, or adducts of said unsaturated monocarboxylic acids with an alpha, beta ethylenically unsaturated carboxylic acid or derivative.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of "dimer or trimer of an aliphatic monocarboxylic acid".

339.5 Reactant which is a fatty acid glycerol ester, a fatty acid or salt derived from a naturally occurring glyceride, tall oil, or a fatty acid derived from tall oil:
This subclass is indented under subclass 339. Subject matter wherein there is at least one reactant which is a fatty acid glycerol ester, a fatty acid or salt derived from a naturally occurring glyceride, tall oil, or a fatty acid derived from tall oil.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the definition of "fatty acid" in the Glossary for a discussion of terms used herein.

340 This subclass is indented under subclass 335. Subject matter wherein a polymer is derived from at least two organic polyamines.

(1) Note. An organodiamine salt of a dicarboxylic acid, wherein each of the diamine salt groups are different and wherein each is a polyamine, would be properly classified herein.

341 This subclass is indented under subclass 335. Subject matter wherein at least one reactant contains a heterocyclic ring with the proviso that the sole heterocyclic group is not a dicarboxylic acid anhydride.

SEE OR SEARCH THIS CLASS, SUBCLASS:
310, for an imide or lactam-containing reactant.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "heterocyclic'.

342 This subclass is indented under subclass 335. Subject matter wherein at least one reactant contains three or more amino-nitrogen atoms, three or more carboxylic acid groups, or is a derivative of an acid containing three or more carboxylic acid groups.

343 This subclass is indented under subclass 335. Subject matter wherein at least one reactant is derived from a (n is an integer) containing dicarboxylic acid or is a carboxylic acid derivative thereof.

344 This subclass is indented under subclass 335. Subject matter wherein at least one reactant contains a bridged or fused ring structure.

(1) Note. A bridged or fused ring system for purposes of this subclass requires that a given ring system be attached at two different nuclear atoms of its ring system to an atom or chain of atoms which, taken together with the two nuclear atoms, forms an additional ring.

(2) Note. Excluded from this subclass as being a fused or bridged ring system is an anhydride group fused or bridged to a ring, which ring by itself is not part of a fused or bridged ring system.

345 This subclass is indented under subclass 335. Subject matter wherein at least one reactant contains an ethylenically unsaturated group.

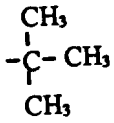
SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "ethylenically unsaturated".

346 This subclass is indented under subclass 335. Subject matter wherein at least one reactant contains a saturated carbocylic ring.

347 This subclass is indented under subclass 335. Subject matter wherein at least one reactant contains an aromatic ring.

348 This subclass is indented under subclass 347. Subject matter wherein all of the reactants contain at least one aromatic ring.

349 This subclass is indented under subclass 335. Subject matter wherein at least one reactant contains a tertiary carbon atom (i.e., bonded to at least three distinct carbon atoms) e.g.,



, etc.

350 This subclass is indented under subclass 332. Subject matter wherein a polymer is derived from a tri or higher carboxylic acid or from a tri-carboxylic acid derivative thereof and an organic amine, or wherein a reactant is an organic amine salt of a tri or higher carboxylic acid or derivative.

(1) Note. The reactant may be the monoamine, diamine, or triamine salt of a tri-carboxylic acid, or it may be a higher amine of a higher polycarboxylic acid, or it may be an organic amine salt of a tri or higher carboxylic acid derivative.

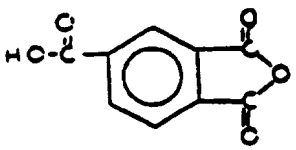
351 This subclass is indented under subclass 350. Subject matter wherein an organic amine salt of a tri- or higher carboxylic acid or acid derivative is polymerized in the presence of a specified material, or wherein a tri- or higher carboxylic acid or acid derivative thereof and an organic amine are polymerized in the presence of a specified material.

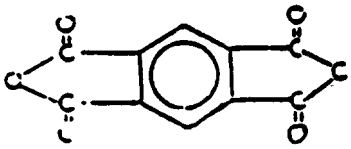
SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "specified material".

352 This subclass is indented under subclass 350. Subject matter wherein at least one reactant contains a phosphorus or sulfur atom.

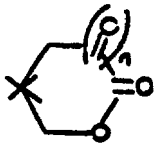
353 This subclass is indented under subclass 350. Subject matter wherein at least one reactant is a tetra or higher carboxylic acid or is an acid derivative thereof.

(1) Note. An anhydride having the general formula, which may be linear or cyclic is considered as being a polycarboxylic acid. A compound having both an anhydride and a free carboxylic acid is considered as being a tricarboxylic acid, e.g., as shown in the first illustration, below, and a compound containing two anhydride groups is considered as being a tetracarboxylic acid, e.g., as shown in the second illustration, below.





354 This subclass is indented under subclass 271. Subject matter wherein at least one reactant is a cyclic ester of a carboxylic acid as ring atoms, e.g., as shown below, wherein n is an integer and wherein X is an atom necessary to complete the ring structure and yet maintain the material as an ester.



SEE OR SEARCH THIS CLASS, SUBCLASS:
271, see the (2) Note.

355 This subclass is indented under subclass 354. Subject matter wherein the cyclic ester is polymerized in the presence of a specified material.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “specified material”.

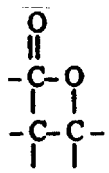
356 This subclass is indented under subclass 355. Subject matter wherein the specified material contains a phosphorus or sulfur atom.

357 This subclass is indented under subclass 355. Subject matter wherein the specified material contains a metal atom.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for the definition of “metals”.

358 This subclass is indented under subclass 357. Subject matter wherein the specified material contains a Group IA (Li, Na, K, Rb, Cs, Fr) or Group IIA (Be, Mg, Ca, Sr, Ba, Ra) metal atom.

359 This subclass is indented under subclass 354. Subject matter wherein the heterocyclic ester is a four-membered ring containing three carbon atoms and one oxygen atom, i.e.,



360 This subclass is indented under subclass 271. Subject matter wherein a carboxylic acid or a derivative thereof contains a sulfur atom.

(1) Note. The sulfur atom may be in the carboxylic acid portion, in the derivative portion, or in both the acid and derivative thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:
364, for the interpolymerization of a non-sulfur-containing carboxylic acid or derivative and a sulfur reactant.

361 This subclass is indented under subclass 271. Subject matter wherein (1) a carboxylic acid contains an ether, alcohol, or metal alcoholate group, or (2) a carboxylic acid derivative contains an ether, alcohol, or metal alcoholate group.

(1) Note. Both the acid and its derivative may contain an ether, alcohol, or metal alcoholate group.

SEE OR SEARCH THIS CLASS, SUBCLASS:
365, for the interpolymerization of a non-cyclic ether-containing carboxylic acid or derivative and a cyclic ether reactant.

362 This subclass is indented under subclass 271. Subject matter wherein at least one organic reactant contains a nitrile of a carboxylic acid.

SEE OR SEARCH THIS CLASS, SUBCLASS:
271, see (2) Note, section D for a definition of the term “nitrile”.

363 This subclass is indented under subclass 271. Subject matter for a polymer derived from at least one carboxylic acid reactant or derivative and at least one nitrogen containing reactant.

364 This subclass is indented under subclass 271. Subject matter for a polymer derived from at least one carboxylic acid or derivative and at least one sulfur-containing reactant.

SEE OR SEARCH THIS CLASS, SUBCLASS:

360, for a polymer derived from a sulfur-containing carboxylic acid or sulfur-containing derivative thereof.

365 This subclass is indented under subclass 271. Subject matter for a polymer derived from at least one carboxylic acid or derivative and at least one cyclic ether reactant.

SEE OR SEARCH THIS CLASS, SUBCLASS:

361, for a polymer derived from an ether-containing carboxylic acid or ether-containing derivative thereof.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “ether”.

366 This subclass is indented under subclass 365. Subject matter wherein the cyclic ether contains only a single three-membered heterocyclic ring having two carbon atoms and one oxygen atom as ring members.

367 This subclass is indented under subclass 1. Subject matter under Class 520, ... involving polymers derived from at least one reactant containing a group or processes of polymerizing; polymerizable compositions containing as a reactant a material having a group or processes of preparing.

(1) Note. Included in this subclass are carbamic acid derivatives and urea.

SEE OR SEARCH THIS CLASS, SUBCLASS:

480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also provide for processes of admixing with a broadly claimed nonreactant material.

SEE OR SEARCH CLASS:

526, Synthetic Resins or Natural Rubbers, subclass 301 for a polymer derived from an ethylenically unsaturated carbamic acid as sole monomer or for a carbamic acid interpolymer wherein all of the reactants used in preparing the polymer are ethylenically unsaturated, and subclass 302 for a polymer derived from an ethylenically unsaturated urea as sole monomer or for a urea interpolymer wherein all of the reactants used in preparing the polymer are ethylenically unsaturated.

368 This subclass is indented under subclass 367. Subject matter wherein a reactant containing a group is polymerized in the presence of a specified material.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “specified material”.

369 This subclass is indented under subclass 367. Subject matter wherein a reactant is a containing material or a derivative thereof.

(1) Note. Derivative is limited to esters, acyl halides, anhydrides, or salts.

SEE OR SEARCH THIS CLASS, SUBCLASS:

271, for a discussion of such derivatives.

370 This subclass is indented under subclass 1. Subject matter under Class 520, ... involving polymers derived from at least one reactant containing a halo or group or processes of polymerizing; polymerizable compositions containing as a reactant a material having a haloor group or processes of preparing.

(1) Note. Included in this subclass are phosgene, carbonic acid, and carbonic acid esters.

SEE OR SEARCH THIS CLASS, SUBCLASS:

480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a

material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also provide for processes of admixing with a broadly claimed nonreactant material.

SEE OR SEARCH CLASS:

526, Synthetic Resins or Natural Rubbers, subclasses 291+ for a polymer derived from an ethylenically unsaturated halogen containing compound having three or more carbon atoms as sole monomer, or for an interpolymer wherein all of the reactants are ethylenically unsaturated and at least one reactant contains three or more carbon atoms and at least one halogen atom, and subclass 314 for a polymer derived from an ethylenically unsaturated reactant containing a group as sole monomer, or for an interpolymer wherein all of the reactants are ethylenically unsaturated and at least one reactant contains a group.

371 This subclass is indented under subclass 370. Subject matter wherein a halo or containing reactant is polymerized in the presence of a specified material.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “specified material”.

372 This subclass is indented under subclass 370. Subject matter wherein a reactant contains a halo group.

373 This subclass is indented under subclass 1. Subject matter under Class 520, ... involving polymers derived from at least one sulfur-containing reactant or processes of polymerizing; polymerizable compositions containing as a reactant a sulfur-containing material or processes of preparing.

SEE OR SEARCH THIS CLASS, SUBCLASS:

480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also provide for processes of admixing with a broadly claimed nonreactant material.

SEE OR SEARCH CLASS:

525, Synthetic Resins or Natural Rubbers, subclasses 343+, for a process of chemically modifying a solid polymer derived from ethylenic monomers only in the presence of a sulfur-containing material; subclasses 256+ for a homopolymer derived from an ethylenically unsaturated sulfur heterocyclic compound or for a sulfur-containing interpolymer wherein all of the reactants are ethylenically unsaturated and at least one of said reactants contains a sulfur atom as part of a heterocyclic ring, and subclasses 286+ for a polymer derived from an ethylenically unsaturated sulfur-containing reactant as sole monomer or for a sulfur-containing interpolymer wherein all of the reactants are ethylenically unsaturated and at least one of said reactants contains a sulfur atom.

374 This subclass is indented under subclass 373. Subject matter wherein a polymer is derived from at least one mercaptan (thiol) or inorganic mercaptide-containing material.

(1) Note. A mercaptan denotes an organic compound having the general structure wherein the carbon atom bound to the sulfur atom of the thiol group is not double bonded to oxygen, sulfur, selenium, or tellurium, or triple bonded to nitrogen.

(2) Note. A mercaptide denotes a salt of a mercaptan.

375 This subclass is indented under subclass 374. Subject matter wherein (1) a polymer is derived from at least two or more mercaptan reactants, or from at least two or more mercaptide reactants, or from at least a mixture of a mercaptan and a mercaptide, or (2) a polymer is derived from a mercaptan or mercaptide and at least one other sulfur-containing reactant.

376 This subclass is indented under subclass 374. Subject matter wherein a mercaptan or mercaptide is reacted with at least one reactant which contains an ethylenically unsaturated group.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "ethylenically unsaturated".

377 This subclass is indented under subclass 373. Subject matter wherein at least one reactant contains a sulfur atom as a ring atom of a heterocyclic ring.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "heterocyclic".

378 This subclass is indented under subclass 377. Subject matter wherein at least one reactant containing a heterocyclic ring having at least one sulfur atom as a ring atom is polymerized in the presence of a specified material.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "specified material".

379 This subclass is indented under subclass 378. Subject matter wherein the specified material contains a Group IA (Li, Na, K, Rb, Cs, Fr) or Group IIA (Be, Mg, Ca, Sr, Ba, Ra) metal atom.

380 This subclass is indented under subclass 377. Subject matter wherein a sulfur heterocyclic reactant contains at least one heterocyclic ring composed of a single sulfur atom and two or more carbon atoms and there are no other atoms in the heterocyclic ring.

381 This subclass is indented under subclass 373. Subject matter wherein a sulfur reactant is elemental sulfur or a sulfur-containing inorganic compound.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, See the Glossary for a definition of "organic compound". An inorganic compound for purposes of this subclass is a compound which does not fit the parameters of said definition.

382 This subclass is indented under subclass 381. Subject matter wherein the inorganic reactant containing sulfur is sulfur diozide (SO2).

383 This subclass is indented under subclass 382. Subject matter wherein sulfur dioxide is polymerized in the presence of a specified material.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "specified material".

384 This subclass is indented under subclass 383. Subject matter wherein the specified material contains a metal atom.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "metals".

385 This subclass is indented under subclass 383. Subject matter wherein the specified material contains a peroxide, free oxygen, air or ozone.

(1) Note. A peroxide denotes a compound containing an -O-O- group.

(2) Note. This subclass does not include the use of air as a blanket or carrier gas.

386 This subclass is indented under subclass 382. Subject matter wherein sulfur dioxide is reacted with at least one material which contains only atoms of hydrogen and carbon.

387 This subclass is indented under subclass 381. Subject matter wherein the inorganic reactant containing sulfur is carbon disulfide ($C5_2$) or hydrogen sulfide (H_25).

388 This subclass is indented under subclass 381. Subject matter wherein the inorganic sulfur reactant contains at least one metal atom or at least one ammonium ion.

389 This subclass is indented under subclass 381. Subject matter wherein at least one reactant is elemental sulfur.

390 This subclass is indented under subclass 373. Subject matter wherein a polymer is prepared from an organic reactant containing a group.

SEE OR SEARCH THIS CLASS, SUBCLASS:

387, for a polymer prepared from carbon disulfide.

391 This subclass is indented under subclass 373. Subject matter wherein a polymer is prepared from an organic reactant containing a sulfur atom bonded to one or more oxygen atoms (e.g., sulfonates, sulfones, etc.).

392 This subclass is indented under subclass 1. Subject matter under Class 520, ... involving polymers derived from at least one ethylenically unsaturated reactant and at least one nonethylenically unsaturated reactant or processes of polymerization; polymerizable compositions containing at least one ethylenically unsaturated reactant and at least one nonethylenically unsaturated reactant or processes of preparing.

SEE OR SEARCH THIS CLASS, SUBCLASS:

480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also provide for processes of admixing with a broadly claimed nonreactant material.

SEE OR SEARCH CLASS:

525, Synthetic Resins or Natural Rubbers, appropriate subclasses for processes of chemically reacting a solid polymer.

526, Synthetic Resins or Natural Rubbers, subclasses 72+ for processes of polymerizing an ethylenic monomer in the presence of an ethylenic material, which ethylenic material concurrently enters into the polymer by reaction with a functional group of the ethylenic monomer and for processes of polymerizing ethylenically unsaturated monomers only.

393 This subclass is indented under subclass 392. Subject matter wherein at least one of the reactants contains a three-membered heterocyclic ring which contains as ring atoms an oxygen atom and two carbon atoms.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “heterocyclic”.

394 This subclass is indented under subclass 1. Subject matter under Class 520, ... involving polymers derived from a boron- containing reactant or process of polymerizing; polymerizable compositions containing a boron-containing reactant or processes of preparing.

SEE OR SEARCH THIS CLASS, SUBCLASS:

4, for a boron-containing reactant wherein a boron atom is bonded to at least one atom of hydrogen or carbon.

480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also provide for processes of admixing with a broadly claimed nonreactant material.

395 This subclass is indented under subclass 1. Subject matter under Class 520, ... involving polymers derived from a heavy metal- or aluminum-containing reactant wherein a heavy metal or aluminum atom is devoid of any bonding to hydrogen or to carbon or processes of polymerizing; polymerizable compositions containing as a reactant a heavy metal or aluminum containing reactant, wherein a heavy metal or aluminum atom is devoid of any bonding to hydrogen or to carbon or processes of preparing.

(1) Note. A heavy metal denotes a metal atom having a specific gravity greater than four.

SEE OR SEARCH THIS CLASS, SUBCLASS:

9, for a heavy metal- or aluminum- containing reactant wherein a heavy metal or aluminum atom is bonded to at least one atom of carbon or hydrogen.

480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also provide for processes of admixing with a broadly claimed nonreactant material.

396 This subclass is indented under subclass 1. Subject matter under Class 520, ... involving polymers derived from a hydrocarbon reactant or process of polymerizing; polymerizable compositions containing as a reactant a hydrocarbon material or processes of preparing.

(1) Note. A hydrocarbon contains only atoms of carbon and hydrogen.

SEE OR SEARCH THIS CLASS, SUBCLASS:

480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also provide for processes of admixing with a broadly claimed nonreactant material.

397 This subclass is indented under subclass 1. Subject matter under Class 520, ... involving polymers derived from a halogenated hydrocarbon reactant or process of polymerizing; polymerizable compositions containing as a reactant a halogenated hydrocarbon reactant or processes of preparing.

(1) Note. Included as halogenated hydrocarbons for purposes of this subclass are those reactants wherein all of the hydrocarbon atoms have been replaced by halogen atoms.

SEE OR SEARCH THIS CLASS, SUBCLASS:

480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also provide for processes of admixing with a broadly claimed nonreactant material.

398 This subclass is indented under subclass 1. Subject matter under Class 520, ... involving polymers derived from a phosphorus-containing reactant or process of polymerizing; polymerizable compositions containing as a reactant a phosphorus-containing material or processes of preparing.

SEE OR SEARCH THIS CLASS, SUBCLASS:

480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also provide for processes of admixing with a broadly claimed nonreactant material.

SEE OR SEARCH CLASS:

526, Synthetic Resins or Natural Rubbers, subclasses 274+ for a polymer derived from a phosphorus-containing ethylenic reactant as sole monomer or for a phosphorus-containing interpolymer wherein all of the reactants used in preparing the polymer are ethylenically unsaturated.

399 This subclass is indented under subclass 398. Subject matter wherein at least one reactant contains at least one phosphorus atom and at least one nitrogen atom.

400 This subclass is indented under subclass 398. Subject matter wherein a phosphorus-containing material is reacted with an alcohol or alcoholate.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “alcohol”.

401 This subclass is indented under subclass 1. Subject matter under Class 520, ... involving polymers derived from a fluorine- containing reactant or process of polymerizing; polymerizable compositions containing as a reactant a fluorine-containing material or processes of preparing.

SEE OR SEARCH THIS CLASS, SUBCLASS:

480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also provide for processes of admixing with a broadly claimed nonreactant material.

SEE OR SEARCH CLASS:

526, Synthetic Resins or Natural Rubbers, subclasses 242+ for a polymer derived from a fluorine-containing ethylenic reactant as sole monomer of fluorine.

402 This subclass is indented under subclass 401. Subject matter wherein the fluorine atom is part of a compound which contains a heterocyclic ring and wherein part of the heterocyclic ring atoms can be represented as an oxygen ether group (e.g., 1, 2-epoxy compounds, etc.).

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the terms “heterocyclic” and “ether”.

403 This subclass is indented under subclass 1. Subject matter under Class 520, ... involving polymers derived from a heterocyclic reactant having at least one oxygen, selenium, or tellurium atom as a ring member or process of polymerizing; polymerizable compositions containing as a reactant a heterocyclic compound having as a ring member at least one atom of oxygen, selenium, or tellurium and processes of preparing.

(1) Note. This subclass includes those compounds which may contain at least one atom of oxygen, selenium, or tellurium together in a heterocyclic ring with nitrogen (e.g., oxazolines, etc.).

SEE OR SEARCH THIS CLASS, SUBCLASS:

230+, for a polymer derived from trioxane, tetraoxane, or hexamethylenetetramine.

377+, for a polymer derived from a heterocyclic reactant containing at least one sulfur atom as a ring member.

422, for a polymer derived from a heterocyclic reactant containing only nitrogen and carbon as ring atoms.

480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also provide for processes of admixing with a broadly claimed nonreactant material.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “heterocyclic”.

526, Synthetic Resins or Natural Rubbers, subclass 260 for polymers derived from only ethylenic monomers and wherein at least one ethylenic monomer contains a five-membered heterocyclic ring and at least one of the ring members is nitrogen and at least one is a oxygen, and subclasses 266+ for polymers derived from only ethylenic monomers and wherein at least one ethylenic monomer has a heterocyclic ring containing at least one oxygen atom as a ring member.

405 This subclass is indented under subclass 403. Subject matter wherein at least one heterocyclic reactant containing at least one oxygen, selenium, or tellurium atom as ring members is reacted with at least one reactant which is devoid of a heterocyclic ring containing oxygen, selenium, or tellurium as ring members.

406 This subclass is indented under subclass 405. Subject matter wherein the heterocyclic reactant contains at least two separate heterocyclic rings each, and wherein each ring contains at least one atom of oxygen, selenium, or tellurium as a ring member.

407 This subclass is indented under subclass 406. Subject matter wherein the reactant which is devoid of a heterocyclic ring containing oxygen, selenium, or tellurium as ring members contains at least one nitrogen atom.

408 This subclass is indented under subclass 403. Subject matter wherein a heterocyclic reactant containing oxygen, selenium, or tellurium as ring atoms is polymerized in the presence of a specified material.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term “specified material”.

409 This subclass is indented under subclass 408. Subject matter wherein the specified material contains a metal atom.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, see the Glossary for the definition of “metals”.

410 This subclass is indented under subclass 409. Subject matter wherein the specified material contains at least one atom of a transition metal.

(1) Note. Transition metal is limited to elements of atomic numbers 21-29, 39-47, 57-79, or 89 and higher.

411 This subclass is indented under subclass 410. Subject matter wherein the transition metal is a Group IVB metal atom (Ti, Zr, Hf).

412 This subclass is indented under subclass 410. Subject matter wherein the transition metal is a Group VIII metal atom (Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt).

413 This subclass is indented under subclass 409. Subject matter wherein the metal is a Group IIA metal atom (Be, Mg, Ca, Sr, Ba, Ra).

414 This subclass is indented under subclass 409. Subject matter wherein the metal is a Group IIB metal atom (Zn, Cd, Hg).

415 This subclass is indented under subclass 414. Subject matter wherein the Group IIB metal material contains a diverse metal atom in the same compound, or wherein a Group IIB material is in admixture with a material which contains a diverse metal atom.

416 This subclass is indented under subclass 409. Subject matter wherein the specified material contains at least one Group IIIA metal atom (Al, Ga, In, Tl).

417 This subclass is indented under subclass 403. Subject matter wherein the heterocyclic reactant contains only a single hetero atom (i.e., oxygen, sulfur, or selenium) in a ring containing three or more carbon atoms and there are no other atoms in the ring (e.g., oxetane, etc.).

418 This subclass is indented under subclass 403. Subject matter wherein the heterocyclic reactant contains at least two three-membered heterocyclic rings, and each of said heterocyclic rings is composed of two carbon atoms and a single oxygen atom as ring members.

419 This subclass is indented under subclass 403. Subject matter wherein a polymer is derived from two or more reactants with the proviso that at least two separate reactants each contain a single three-membered heterocyclic ring having two carbon atoms and a single oxygen atom as ring members.

420 This subclass is indented under subclass 403. Subject matter wherein a heterocyclic reactant contains at least one nitrogen atom and a single three-membered heterocyclic ring which contains two carbon atoms and one oxygen atom as ring members.

421 This subclass is indented under subclass 403. Subject matter wherein the heterocyclic reactant contains a single three-membered heterocyclic ring which is composed of two carbon atoms and one oxygen atom.

422 This subclass is indented under subclass 1. Subject matter under Class 520, ... involving polymers derived from a nitrogen- containing reactant or process of polymerizing; polymerizable compositions containing as a reactant a nitrogen-containing material or processes of preparing.

SEE OR SEARCH THIS CLASS, SUBCLASS:

480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also provide for processes of admixing with a broadly claimed nonreactant material.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for the definition of "heterocyclic".

423 This subclass is indented under subclass 422. Subject matter wherein at least one reactant contains a heterocyclic ring which has only nitrogen and carbon atoms as ring members.

424 This subclass is indented under subclass 423. Subject matter wherein at least one nitrogen heterocyclic reactant contains a three-membered heterocyclic ring which has two carbon atoms and one nitrogen atom as ring members.

425 This subclass is indented under subclass 1. Subject matter under Class 520, ... involving polymers derived from an organic oxygen-containing reactant or processes of polymerizing; polymerizable compositions containing as a reactant an organic oxygen-containing material or processes of preparing.

SEE OR SEARCH THIS CLASS, SUBCLASS:

480+, for processes of preparing a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. Subclasses 480+ also provide for processes of admixing with a broadly claimed nonreactant material.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, see the Glossary for a definition of the term "organic compound".

480 This subclass is indented under subclass 1. Processes under Class 520, ... wherein a solid polymer which has been derived from at least one ethylenic monomer, or a material which is in contact with the polymer, is treated.

(1) Note. Materials with which the polymer is in contact includes the reactants forming the polymer, their nonpolymeric reaction products, the solvents used for polymerization, etc.

(2) Note. The specific treatments provided herein need not occur in the presence of the polymer.

(3) Note. Contacting of the polymer or material in presence therewith, with a solid material which is inert and which merely functions as a physical barrier (e.g., container, storage, facility, filter paper); or which contacts the material so as to cool or heat, or which transports (e.g., pipe, tube); or which manipulates (e.g., stirrer, centrifuge) are normally not considered as a basis for classification herein.

(4) Note. This subclass provides for those processes wherein the desired polymer is not chemically modified. Processes, however, which involve a chemical reaction of material other than the polymer are proper herein.

(5) Note. This subclass provides for processes of treating a polymer not involving a chemical modification of the polymer, by the addition of a material thereto, and for chemically modifying material other than the polymer. This subclass and its indents also provide for processes of admixing with a broadly claimed nonreactant material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

491+, for separating polymer by filtration from a liquid diluent and contacting the liquid diluent which is now devoid of polymer with an organic compound.

482, through 499, for contacting with material which requires the combination of at least two materials that differ in composition, for example, adding more of a given material to a solution containing that material would be considered an addition since the solution differs in composition from the added material. However, mere division of a stream into two portions, followed by a heating or cooling of one of the portions, with a subsequent recombining operation of the two portions would not be considered "contacting" since the two portions are compositionally equivalent.

SEE OR SEARCH CLASS:

523, Synthetic Resins or Natural Rubbers, subclasses 1+ for a composition of a previously formed solid polymer and a nonreactive material.

525, Synthetic Resins or Natural Rubbers, for processes of chemically modifying a solid polymer by the addition of a chemical treating agent thereto.

481 This subclass is indented under subclass 480. Processes wherein a polymer or a polymer-containing material is cooled to 0°C (32°F) or less, or is heated to a temperature of 200°C (392°F) or higher.

482 This subclass is indented under subclass 480. Processes wherein a solid sorbent mass is used to retain on its surface a constituent of a mixture, or wherein an ion-exchange material is used to contact the polymer or polymer-containing material.

(1) Note.

(A)A solid sorbent is a material which separates a constituent from a fluid mixture containing such constitutents in a "quasi chemical" manner. The action in most instances is that of selective retention (e.g., the sorbent removes only the part of the fluid mixture for which it has the greatest affinity). The retained portion cannot be removed by mechanical action but generally requires heating or use of a stripping or denuding fluid.

(B)A filter is not proper herein since a filter has no particular "chemical" affinity for a constituent of the fluid mixture. The separation in the case of a filter depends upon a mechanical entrapment of the solid particles because of their relatively large size compared to the interstices or spaces between individual elements of the filter. In the case of a filter, mechanical brushing, wiping, shaping, etc., will remove the retained particles.

(2) Note. Solid sorbent includes but is not limited to diatomaceous earth, kieselguhr, perlite, activated carbon, asbestor, colloidal clays, molecular sieves, etc.

(3) Note. Ion exchange is a process in which ions are chemically transferred from a material to a liquid or solid separatory substance or exchanger which, because of its chemical structure of loosely bound ions, has an affinity for certain ions and gives up some of its own ions to the material. The exchange occurs between ions of like charge; the exchanger substance can usually be regenerated by passing another material through it to elute the previously sorbed ions and replace them with the original kind of loosely bounds ions. These ions exchanger substances are usually solid resins.

SEE OR SEARCH CLASS:

95, Gas Separation: Processes, subclasses 90+ for processes of gas separation using solid sorbents.

203, Distillation: Processes, Separatory, subclass 41, for a separatory distillation process including the step of passing the produced vapor through a solid sorbent.

210, Liquid Purification or Separation, subclasses 660+, for liquid purification by ion exchange or sorption.

483 This subclass is indented under subclass 480. Processes which involve contacting the polymer-containing material with a gaseous material which material is other than a carrier, blanket, or drying gas.

(1) Note. “Gas” for purposes herein includes vapor, mist, or smoke.

(2) Note. Excluded from this subclass is the production of a gas by an “in situ” reaction wherein the production of the gas is effected by treatment in the presence of the polymer.

(3) Note. Air, carbon dioxide, steam, N2, and the inert gases are generally the type of gases to be excluded from this subclass by the use of the terms “carrier, blanket, or drying gas.” Absent any disclosure to the contrary “gas” will be taken to mean one of these gaseous materials utilized as enumerated above and will be excluded herefrom.

(4) Note. Materials which are bifunctional and which have both a carrier, blanket or drying effect and also exhibit another effect such as a reactant, or as an extracting medium, are proper for this subclass.

484 This subclass is indented under subclass 480. Processes wherein the accumulation of material on the reactor wall or on parts of the processing equipment is prevented or removed.

SEE OR SEARCH CLASS:

526, Synthetic Resins or natural Rubbers, subclass 74 for a polymerization process utilizing a nondiluent-type material so as to prevent clogging or fouling of the reactor or processing equipment.

485 This subclass is indented under subclass 480. Processes wherein a material containing at least one atom of aluminum or of a heavy metal contacts the polymer or the material which is in contact with the polymer.

486 This subclass is indented under subclass 480. Processes wherein a polymer-containing material is contacted with a carboxylic acid, a carboxylic acid salt, or a carboxylic acid anhydride.

SEE OR SEARCH THIS CLASS, SUBCLASS:

491+, for contacting in the the presence of a carboxylic acid ester or acyl halide.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Rubbers, see the Glossary for a definition of the term “carboxylic acid”.

487 This subclass is indented under subclass 480. Processes wherein the polymer or polymer-containing material is contacted with a material containing a phosphorus or sulfur atom.

488 This subclass is indented under subclass 480. Processes wherein the polymer or polymer-containing material is contacted with a treating material which contains at least one atom of an alkali metal or alkaline earth element.

(1) Note. Alkali metal is limited to elements, Li, Na, K, Rb, Cs, Fr, Alkaline earth metal is limited to elements Be, Mg, Ca, Sr, Ba, Ra.

489 This subclass is indented under subclass 488. Processes wherein the alkali metal or alkaline earth metal is in the form of an oxide or hydroxide.

490 This subclass is indented under subclass 480. Processes wherein a polymer or polymer-containing material is contacted with a material which is a free element or an inorganic compound, which materials are other than air, water, N, and the inert gases (Group VIIIA) or mixtures composed solely of these materials.

SEE OR SEARCH THIS CLASS, SUBCLASS:

491+, appropriate subclasses for the use of an aqueous organic material as a contacting agent.

499+, for processes involving the use of water as a contacting agent.

491 This subclass is indented under subclass 480. Processes wherein the polymer or polymer-containing material is contacted with an organic compound.

492 This subclass is indented under subclass 491. Processes wherein the organic compound is a nitrogen-containing compound.

493 This subclass is indented under subclass 491. Processes wherein the organic compound is an aldehyde or ketone.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Rubbers, fsee the Glossary or a definition of the terms “aldehyde” or “ketone”.

494 This subclass is indented under subclass 491. Processes wherein the organic compound is an oxygen-containing ether.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Rubbers, see the Glossary for a definition of the term “ether”.

495 This subclass is indented under subclass 491. Processes wherein the organic compound is an alcohol.

(1) Note. This subclass includes phenols as being an alcohol.

SEE OR SEARCH THIS CLASS, SUBCLASS:
488, for a contacting agent wherein the hydrogen of a hydoxyl group has been replaced by an alkali metal or by an alkaline earth metal atom.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Rubbers, see the Glossary for a definition of the term “alcohol”.

496 This subclass is indented under subclass 495. Processes wherein the hydroxy compound contains from one to four carbon atoms.

497 This subclass is indented under subclass 491. Processes wherein the organic compound consists of atoms of hydrogen and carbon only.

498 This subclass is indented under subclass 497. Processes wherein the organic compound is devoid of any aromatic or cycloaliphatic group.

499 This subclass is indented under subclass 480. Processes wherein the polymer or polymer-containing material is brought into contact with material.

(1) Note. Included herein is contact with water in any of its physical forms.

500 This subclass is indented under subclass 499. Process wherein the polymer or the polymer-containing material is separated by vaporizing and condensing at least a portion of the material, so as to isolate in the condensed liquid or in the unvaporized portion a comparatively pure compound, which compound was present in the original mixture and wherein the separation is effect by contacting the material to be separated with steam so as to reduce the partial vapor pressure of the component of the material desired to be recovered.

(1) Note. This subclass includes the addition of water which is converted to steam in the distillation device as well as the addition of steam to the distillation process.

SEE OR SEARCH CLASS:
202, Distillation: Apparatus, subclasses 81+, for distillation apparatus utilized in steam stripping or distillation.
203, Distillation: Processes, Separatory, subclasses 95+, for separatory distillation processes including the addition of water or steam which are of general utility.

501 This subclass is indented under subclass 480. Processes wherein a polymer or polymer-containing material is exposed to a pressure decrease so as to effect a separation therein, or wherein a polymer or polymer-containing material is subjected to a distillation operation so as to effect a separation therein.

(1) Note. Included herein are processes of effecting a separation by cooling under a reduced pressure, or by partial vaporization by a sudden pressure reduction, such

as by the introduction of a feed stream under pressure high enough to prevent ebullition into a zone of lesser pressure, which introduction results in the volatizing of at least a portion of the distilland.

SEE OR SEARCH THIS CLASS, SUBCLASS:

503, for a process of vaporizing material under heat without any attempt to condense the volatized component.

SEE OR SEARCH CLASS:

62, Refrigeration, subclasses 9+ for processes of liquefaction wherein autorefrigeration by pressure reduction is utilized to effect separation.

159, Concentrating Evaporators, for processes of general utility for concentrating solids in solution or suspension by volatizing the liquid and note especially subclass 2.1 for flash evaporators of general utility.

202, Distillation: Apparatus, for apparatus for carrying out distillation processes.

203, Distillation: Processes, Separatory, for processes of general utility for separation of the components of a feed mixture by distillation.

208, Mineral Oils: Processes and Products, for distillation processes wherein the comparatively pure component recovered is a mineral oil.

502 This subclass is indented under subclass 480. Processes wherein the polymer or polymer-containing material is treated by the application of a physical force.

(1) Note. Generally the physical force which acts upon the material causes a deformation, flow, or breakdown of the material (e.g., cutting, comminuting, shearing, etc.).

503 This subclass is indented under subclass 480. Processes wherein the polymer or polymer-containing material is held at a constant temperature other than ambient or heat is applied, or cooling is utilized.

(1) Note. This subclass includes processes which consist in holding the effluent from a polymerization zone at a constant temperature, as well as holding the recovered polymer at some constant temperature to effect some alteration in its properties.

CROSS-REFERENCE ART COLLECTIONS

The following subclasses are collections of published disclosure pertaining to various aspects of art relating to solid polymers, and which aspects do not form an appropriate base for subclass classification in the classification schedule.

(1) Note. Disclosures are placed for value as a search aid and in no instance do they represent the entire extent of the prior art.

901 Subject matter involving Si-H or -Si-C -containing materials which normally cure by reaction at ambient temperature with atmospheric moisture.

902 Subject matter involving particulate polymers formed from at least one -N=C=C- containing reactant (X is a chalcogen atom).

903 Subject matter involving the treating of a polymer derived from at least one -N=C=X- containing reactant (X is a chalcogen atom) or the polymerizing of at least one -N=C=X- containing reactant in the substantial absence of water, e.g., under anhydrous conditions.

904 Subject matter involving a polymer derived from at least one -N=C=X- containing reactant (X is a chalcogen atom) which has a specific affinity for or aversion to water, i.e., possessing hydrophilic or hydrophobic properties.

905 Subject matter involving a polymer derived from at least one -N=C=X- containing reactant (X is a chalcogen atom) which has adhesive properties.

906 Subject matter involving a polymer derived from at least one -N=C=X- containing reactant (X is a chalcogen atom) which is utilizable as a fiber or has elastomeric properties.

930 GUAYULE RUBBER:
Subject matter involving guayule rubber.

931 PHYSICAL TREATMENT OF NATURAL RUBBER OR NATURAL RUBBER CONTAINING MATERIAL OR CHEMICAL TREATMENT OF NONRUBBER PORTION THEREOF, E.G., EXTRACTION OR RUBBER FROM MILK WEED, ETC.:
Subject matter relating to the recovery and physical processing of natural rubber.

932 Protein removal or conversion:
This subclass is indented under subclass 931. Subject matter relating to treatments which remove or convert the protein portion of natural rubber as obtained from the plant source.

933 Resin removal or conversion:
This subclass is indented under subclass 931. Subject matter relating to treatments to remove or convert the resin portion of natural rubber as obtained from the plant source.

934 Latex:
This subclass is indented under subclass 931. Subject matter relating to natural rubber latex.

SEE OR SEARCH CLASS:
516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 53+ for colloid systems of aqueous continuous phase with discontinuous phase primarily organic liquid or agents for such systems or making or stabilizing such systems or agents, subclasses 135+ for compositions for or subcombination compositions for or breaking of or inhibiting of colloid systems (e.g., emulsion breaking, dispersion inhibiting, suspension settlying, coagulating, flocculating); in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

935 Preserving or stabilizing:
This subclass is indented under subclass 934. Subject matter relating to preserving or stabilizing natural rubber latex.

SEE OR SEARCH CLASS:
516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 53+ for colloid systems of aqueous continuous phase with discontinuous phase primarily organic liquid or agents for such systems or making or stabilizing such systems or agents, subclasses 135+ for compositions for or subcombination compositions for or breaking of or inhibiting of colloid systems (e.g., emulsion breaking, dispersion inhibiting, suspension settlying, coagulating, flocculating); in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

936 Coagulating:
This subclass is indented under subclass 934. Subject matter relating to coagulation of natural rubber latex.

SEE OR SEARCH CLASS:
516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 53+ for colloid systems of aqueous continuous phase with discontinuous phase primarily organic liquid or agents for such systems or making or stabilizing such systems or agents, subclasses 135+ for compositions for or subcombination compositions for or breaking of or inhibiting of colloid systems (e.g., emulsion breaking, dispersion inhibiting, suspension settlying, coagulating, flocculating); in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

937 Concentrating, e.g., creaming etc.:
This subclass is indented under subclass 934. Subject matter relating to concentration of natural rubber latex.

SEE OR SEARCH CLASS:

516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 53+ for colloid systems of aqueous continuous phase with discontinuous phase primarily organic liquid or agents for such systems or making or stabilizing such systems or agents, subclasses 135+ for compositions for or subcombination compositions for or breaking of or inhibiting of colloid systems (e.g., emulsion breaking, dispersion inhibiting, suspension settlying, coagulating, flocculating); in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

950 Polymers useful for replacing hard animal tissues, e.g., dentures bones, etc.:

Subject matter pertaining to synthetic resins for use in replacing or restoring partially or wholly hard tissue as normally found in animals.

(1) Note. The type of polymers provided for herein include those derived from ethylenic monomexs only and these from condensed monomers only. This subclass does not provide for polymer compositions.

(2) Note. Specifically excluded from this subclass are synthetic hair or skin and contact lenses.

SEE OR SEARCH CLASS:

128, Surgery, for the methods of treating living body and apparatus used in inspection and treatment of diseases, wounds, and other abnormal conditions of animals.

433, Dentistry, for methods, apparatus, implements and devices relating to the treatment of teeth or gums, or replacement of teeth.

523, Synthetic Resins or Natural Rubbers, subclasses 105+ for nonmedicated compositions containing a synthetic resin having utility specifically intended to be for contact with animal living tissue, especially subclasses 109 and 113-120 for dental compositions or to processes of preparing said compositions.

604, Surgery, for medicators and applicators.

623, Prosthesis (i.e., Artificial Body Members), Parts Thereof or Aids and Accessories Therefor, appropriate subclasses for artificial parts for human bodies peculiarly adapted and structured to replace missing members or to repair a defect in a human body.

END